

# GIANT HOLIDAY GIFT GUIDE

## PETERSEN'S **4WHEEL** & OFF-ROAD



**OUR SOLID-AXLE  
TAHOE HITS DIRT**

# READERS' RIDES INSIDE

**JEEPS OF  
EVERY SIZE**



**BRONCOS,  
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LEAST ONE  
WHEELIN'  
ROVER!**

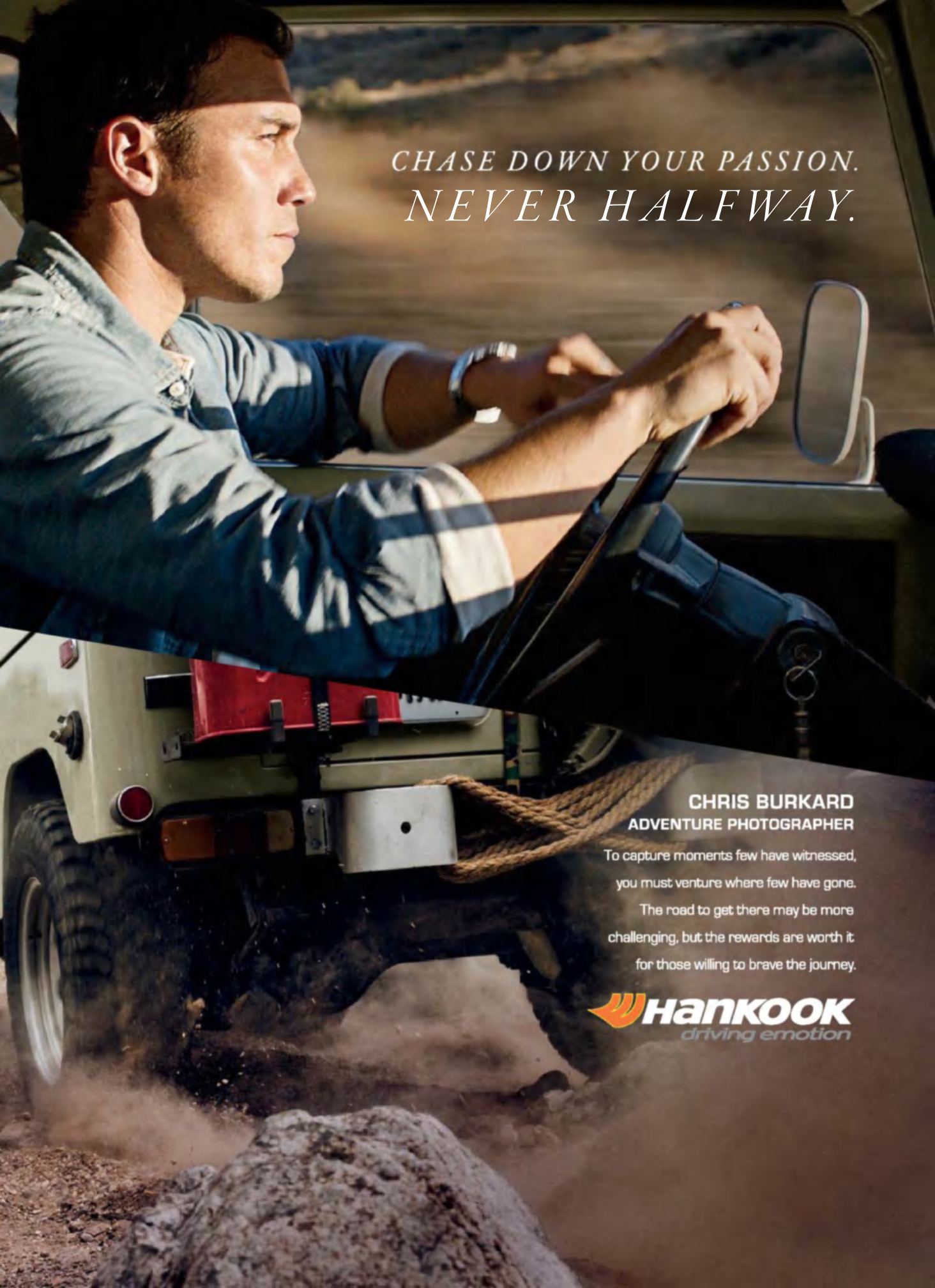
- > **CUMMINS CRUISER ON 44s**
- > **MORE MAD MAXXIS MUSCLE CAR**
- > **RETURN OF THE TRACKER PROJECT**









A man with dark hair, wearing a blue and white striped long-sleeved shirt, is driving a vehicle through a rocky, dusty landscape. He is looking forward with a focused expression. The vehicle's steering wheel and side mirror are visible. The background is a blurred, hilly terrain under bright sunlight.

*CHASE DOWN YOUR PASSION.  
NEVER HALFWAY.*

**CHRIS BURKARD**  
ADVENTURE PHOTOGRAPHER

To capture moments few have witnessed,  
you must venture where few have gone.

The road to get there may be more  
challenging, but the rewards are worth it  
for those willing to brave the journey.

 **HANKOOK**  
driving emotion



32



66



46



54

## COVER STORY READERS' RIDES ROUNDUP

### 16 YOUR RIGS YOUR WAY

The time of year when our fans strut their stuff.

## SPECIAL STORY 2015 HOLIDAY GIFT GUIDE

### 70 WHAT WHEELERS WANT

Ho, ho, ho for 4-Lo.

## TECHNICAL

### 29 ON TRACK

**PART 3:** We return to and revise the drivetrain in our featherweight Tracker project.

### 38 BFG'S LATEST ALL-TERRAIN

Wheeling in a ghost town to test the new T/A KO2s.

### 43 ULTIMATE SUMMER CAMP JEEP

**PART 6:** Lots of little things that helped finish our Ultimate Adventure Jeep.

### 50 MAXXIS OFF-ROAD RUNNER

**PART 2:** Frame building and an Apocalypse-ready Dyntrac 80.

### 60 ROSCO P. DRIVETRAIN

**PART 6:** Gearing, lockers, and steering.

### 66 DIY GEAR INSTALL

It helps to know what you're doing.

## FEATURES

### 32 CUMMINS-POWERED LAND CRUISER

The 4BT-40 makes short work of most trails.

### 46 BODACIOUS-BUILT BABY BLAZER

A disabled SUV became the beast you see here.

### 54 REASONS TO CROSS THE RUBICON

Wheeling with Jeep Jamboree USA.



THE  
ENTHUSIAST  
NETWORK

## DEPARTMENTS

6 4XFORWARD

8 IN BOX

10 DRIVELINES

77 NUTS & BOLTS

79 MARKETPLACE

90 WHOOPS!

**ON THE COVER:** We are always looking for more readers' rides and whoops. If you send them in, you may just end up on the cover of this very magazine, like these folks did!





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BY 4xFredWilliams



## EXCUSES TO FOLLOW A DREAM (OR BUY ANOTHER JEEP)

**I** BOUGHT ANOTHER OLD JEEP. I KNOW—THOSE OF YOU WHO DON'T LIKE JEEPS are tired of seeing Jeeps in *4-Wheel & Off-Road*, and I respect that. I understand that there are other cool makes and models of 4x4s that we need to cover. I also understand that I have way too many projects. But you know how sometimes you hear about a cool old Wagoneer that's been sitting in a garage for 10 years, and it's still in the original owners name, and it's still stock, and it has a Warn 8274 winch on the front (pretty much the best winch ever made)? Well, that's what happened. My friends said they had this Jeep and wondered if I knew of a good home for it. The next thing you know I'm sending money to buy a Jeep sight-unseen. Jeez, I have a problem.

The Jeep is a 1972 with 89,000 miles on it, and I'm going to try really hard to leave it stock. You read that right. No giant lift, no 40s, no tons, no rooftop tent, no LS engine swap. I repeat: No LS engine swap. I already have Jeeps with that stuff, and those parts are awesome and great and fun and drool-worthy and make wheeling a total and complete hoot! But this Jeep is different. 2016 is the 75th anniversary of the Jeep brand, and I really wanted a fun Jeep to celebrate with (Excuse No. 1). This Jeep is perfect for camping, cruising to the beach, chugging through the dunes, exploring backcountry dirt roads, taking dogs to the park, squirting the special lady friend to the drive in, and going on parts runs (Excuses 2 through 7). At least that's what I'm picturing doing with it. The fact is it has as much chance towing an Airstream to a national park as it does being a giant sink-hole for money as I try and make it road worthy. But hey, I've never had a Wagoneer before and this seems like a perfect candidate for me to adopt and cherish and get dirty. Plus, Jeep execs have been claiming there will be a new Wagoneer in the future lineup, so I might as well get an old one to compare it to (Excuse No. 8).

Yes, I'm really trying to justify this purchase.

I'm stoked to have a new (to me) Jeep to play with. The Jeep is sitting two states away, and I'm not sure how much work it needs, but I'm planning on driving it home and doing some of those goals (excuses) along the way. (If it breaks down and I have to sleep in it, does that count as camping?)

I guess the point of this rant (or is it a rave?) is that sometimes a good deal comes along that you can't pass up. And sometimes you need to throw caution to the wind, buy a derelict 4x4 from another state, and go fix it so you can drive it home. Because adventure happens when you follow a dream and also when you're not 100 percent prepared. 🍌

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### EDITORIAL

**NETWORK CONTENT DIRECTOR** Rick Péwé  
**EDITOR** Fred Williams, fred.williams@4wheeloffroad.com, facebook.com/4xfred, Instagram & Twitter @4xfredwilliams  
**MANAGING EDITOR** Craig Johnson  
**SENIOR EDITOR** Verne Simons  
**CONTRIBUTORS** Drew Hardin, Brittany Hill, Jay Kopycinski, Trenton McGee, Tom Morr, Harry Wagner

### ART DIRECTION & DESIGN

**ART DIRECTOR** Alan Huber

### MANUFACTURING & PRODUCTION OPERATIONS

**VP, MANUFACTURING & AD OPS.** Greg Parnell  
**SENIOR DIRECTOR, AD OPS.** Pauline Atwood  
**ARCHIVIST** Thomas Voehringer

### READER SERVICES

4WHEELANDOFFROAD@EMAILCUSTOMERSERVICE.COM; or write to *4-Wheel & Off-Road*, P.O. Box 420235, Palm Coast, FL 32142-0235; or call 800.800.4294. International: 386.447.6385. Please include name, address, and phone number on any inquiries.

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## ADVERTISING

**GENERAL MANAGER** Steve vonSeggern,  
svonseggern@enthusiastnetwork.com  
**ASSOCIATE GENERAL MANAGER** Kurt Miller  
**ADVERTISING COORDINATOR** Carla Baker  
**EVENT COORDINATOR** Glenda Mack

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## FAUX COVER & COVERAGE

Dear Fred, I've been a subscriber to 4WOR for over 20 years, since even before Freiburger threw out all the show trucks and started the magazine on the path that it is basically on today: go over show, real-world tech, and so on. This is the path that has led to the magazine's continued success. However, the December 2015 issue has me concerned for the future of the magazine. For starters, why the hell was there a freaking side-by-side on the cover?! And then there's a *nine-page* buyer's guide on side-by-sides inside?! I get that the SxS market and four-wheeling are kind of related (both involve dirt, but that's about it) and even understand running the occasional review or tech article on one for the off-roaders that have a passing interest, but this is taking it too far.

News flash: If someone really wants to read about side-by-sides, they will pick up a side-by-side magazine. There are several of them to choose from on the newsstands.

I doubt that the new focus on these overgrown trail gnats stems from reader interest and is more than likely a cheap advertising ploy. If your advertising geeks insist on SxS coverage, start a magazine devoted to them staffed by people that are into them. If you're going to start covering side-by-sides regularly, why not hiking or mountain biking or dirt bikes? Those market segments all have similar demographics, so why not? The answer: Because you will never do a better job covering those markets than magazines that focus solely on each one. Trying to cram SxS coverage into 4WOR does nothing but dilute the focus of the magazine and reduces its value while taking away limited editorial space that should be geared toward your core audience.

**RICHARD B.**

*Via email*

P.S.: I know the SxS cover was fake and could be removed to reveal the real cover (which was badass). Too bad the real cover ripped when I tried to remove the offending fake cover.

Side-by-sides are here to stay. 15 years ago everyone was saying the same thing about rock buggies, that they didn't have a place in 4WOR because they weren't trucks



or Jeeps, or that they were too hard to build. Now they are on trails all over America and in 4WOR. The same goes for side-by-sides. Plus, they are fun in the dirt. The continued success of the magazine isn't due to just addressing trail trucks over show trucks, it's because we watch, follow, and lead amongst the current trends in

4-wheel drive and off-road vehicles. We don't believe that you wouldn't want to go carving some dunes in the new Yamaha YXZ 1000R if you had the chance. It's a bit weird-looking if you're used to a Jeep or fullsize truck, but it flat-out hauls. Side-by-sides in general allow new users an avenue into this sport, hobby, and lifestyle. The same can be said for Jeep JK Rubicons, and we'll keep covering those too. But don't worry; we're not going to become a side-by-side magazine. We just consider them another one of the many options out there to enjoy the off-road trails, the same as a mud truck, a prerunner, a rock-crawler, or a Chevy, Toyota, Ford, and so on. Heck, we'd love to show more 4x4 vans with overlanding interiors and cool murals while running neat diesel engines and 1-ton axles, but the fact is there are more side-by-sides on the trail than vans!

We'll whip the sales guys for selling an ad disguised as a fake cover. (We are sorry your real cover tore. That stinks.) And we'll keep covering as many makes and models of 4x4s as we can find (especially those that see dirt every weekend) and showing tech and adventures for all. But although that coverage may end up being a brand, model, or style of 4x4 you may not appreciate personally, we hope it is something you can appreciate as another way to enjoy the trails we all use, even if it's not your first choice.

## THE FAITHFUL READER

First off, love the magazine. I've been getting it since I was 14 years old. I was wondering if y'all ever did a test and compare on DUI distributors, and if so, how can I find it? If not, will y'all do one? I just bought one for my Scout II.

**WINDELL C.**

*Via Facebook.com/4wheeloffroad.com*

Thanks! We, too, love the magazine and hope to keep it around for a while yet. We've used DUI distributors in a few older projects

and have nothing but good things to say about them. Installation is easy, and they make older engines work via a reliable and maintenance-free system borrowed from the engineers at GM. We have not, however, used one in a Scout engine, but the idea is universal and we bet you'll love it.

## 4-WHEEL & USED CAR SALES

Are you, or anyone you know, looking to buy a 1946 Jeep Willys?

**JUSTIN V.**

*Via Facebook.com/4wheeloffroad.com*

Lots of people would like to buy a 1946 Willys. Anyone who might is going to want more details on what you've got and what you want to get for it. Also, you can try Craigslist, ewillys.com, or any local forums. If those don't work you can always park it along a popular roadway with a For Sale sign in the window! Or simply whisper into the wind, "Flatfender Jeep for sale," and Rick Péwé will show up at your door.

## TAHOE ACTUATOR

Is there an upgrade made for a 1995 Tahoe that will give me locking hubs? I am tired of replacing the actuator on the front diff.

**JAMES S.**

*Via Facebook.com/4wheeloffroad.com*

If you're going to use your Tahoe primarily off-road, you should consider a solid axle conversion. There are a few 1992-2000 1500s, Tahoes, and Suburbans out there with solid front axle swaps. The frames on all of these trucks (and the GMC equivalents) should be the same as yours. A web search will give you an idea of what's involved with a solid axle swap (also called an SAS) like this. Also, you can check out our project Rosco P. Drivetrain to see what we did on a slightly newer Tahoe ([goo.gl/vDV8Bmz](http://goo.gl/vDV8Bmz)).

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BY Drew Hardin

## SUPER DUTY NEW FOR 2017

Ford is calling the new 2017 Super Duty pickups the “toughest, smartest, most capable” Super Duty trucks “ever.” We’ll reserve judgment until we get engine output numbers and towing and hauling specs, but it looks like Ford is making every effort to stay competitive in this hard-fought truck segment.

The 2017 Super Duties have been revised from the ground up. They’re built around an all-new, fully boxed ladder frame that is made almost entirely of high-strength steel, so it is far stiffer than the previous frame. Ford also says the trucks will get “heavier duty four-wheel-drive components, driveline, axles, and towing hardware,” though no details about these components are available yet.

The truck will be offered in five wheelbase lengths, from 141.6 to 176 inches, which should correspond to a long box behind the regular cab, and short- and longbeds behind the SuperCab and Crew Cab cabs.

Taking a page from the F-150, the Super Duty bodies are now made from aluminum alloy, offering both corrosion resistance and weight savings. In fact, Ford says the combination of the high-strength steel frame and alloy body sheds up to 350 pounds, weight that will be “reinvested” in the truck’s towing and hauling capabilities.

A neat feature about the truck bed: The tailgate can be locked and unlocked—and opened—with the key fob.

Powertrain choices will include a 6.2L gas V-8, a 6.8L gas V-10 (for chassis-cab trucks), and the second-generation 6.7L Power Stroke diesel V-8. All engines will be mated to TorqShift six-speed automatic transmissions, although F-250 models with the 6.2 V-8 will be fitted with a new version, the TorqShift-G, capable of improved capability and increased fuel economy and torque, says Ford.



Ford offered quite a bit more detail about the new electronic tech going into the Super Duties than the mechanical components. There are a lot of cameras (up to seven), including high-def cameras in the grille, mirrors, and roof to give drivers a 360-degree view around the truck. Those who tow (especially with fifth wheels) will like the rearview camera in the high-mounted center brake light. An optional camera can be attached to the trailer for better visibility while backing up.

High-tech driver assist systems onboard include lane departure warnings, adaptive cruise control (with brake support), and a system called BLIS (Blind Spot Information System). BLIS uses radar sensors in the taillights to monitor areas that may not be visible to the driver. If you’re towing, the sensors extend the length of a trailer.

The Super Duty trucks will go on sale in fall 2016 in XL, XLT, Lariat, King Ranch, and Platinum trim levels. We’ll bring you more details as they come in from Ford.



“The toughest, smartest, most capable Super Duty ever”



## WIN THIS JEEP!

Got five bucks? Don't spend it on a fancy coffee drink. Pick up a raffle ticket to win this JK, compliments of the California Four Wheel Drive Association (CAFWDA). That's right, you could win this Wrangler, complete with all its upgrades (valued at about \$47,000), for just \$5. The add-ons include GenRight aluminum fenders, rear bumper, and rock rails; a Currie Rock Jock 44 front axlehousing; Yukon Zip pneumatic lockers front and rear; an Atlas II 4.3:1 transfer case; JE Reel driveshafts;

BDS suspension with Fox shocks; 37-inch BFG Krawlers on Raceline 982 Raptor wheels; PSC hydro-assist steering; an ARB fridge-freezer; a Viar compressor; PRP seats; a Rock Hard cage; Rugged Ridge half-doors and hood; a Kicker stereo; a Warn Zeon winch; and a 50-inch light bar from Snevys.

The drawing will held February 20, 2016, at the CAFWDA convention in Rancho Cordova, California, but you don't have to be present to win. Net proceeds go directly towards the fight to keep our public lands open. To buy a ticket, go to [cal4wheel.com](http://cal4wheel.com).

## THIS JUST IN

### ● WHEN THE NORRA MEXICAN1000

makes its next run down the Baja peninsula from Ensenada to San Jose del Cabo on April 23-27, new racing formats and vehicle classifications will be among the changes made to the growing event. Race classes will now be broken out into six eras, defined primarily by the technology available when the race vehicles were introduced, say NORRA organizers. The eras include Pioneer (1967-1975), Legend (1976-1982), Challenger (1983-1988), Vintage (1989 to 20 years old), Historic (unlimited vehicles older than 20 years), and Evolution (modern race cars). Within each era are divisions for trucks, buggies, Bugs, and other race vehicles common to the time period. The winner in each era receives a trophy, but no overall trophy will be awarded. The rulebook and more information is posted at [norra.com](http://norra.com).

### ● “IT WAS ONE OF THOSE WINS

that falls into your lap,” said Gus Vildosola Jr. about his overall and Trophy Truck victory at the Rigid Industries SCORE Imperial Valley 250. Vildosola admitted to some navigation errors during the 288-mile race, but his Method Wheels Mexicana Logistics Ford Raptor was always in the hunt, trailing race leader Steven Eugenio all day long. When Eugenio suffered an engine failure 5 miles before the finish line, Vildosola was right there to “cruise it in.” Vildosola covered the course in five hours 10 minutes 17 seconds, for an average speed of 55.75 mph.

### ● POLARIS IS DONATING FOUR ATVS

and commercial vehicles—a Ranger, a Hippo, a Brutus, and an M1400—to the Salvation Army to aid in the organization's natural disaster relief efforts. Polaris is also donating an assortment of front attachments and set of TerrainArmor non-pneumatic tires (which won't go flat) for the Brutus.

### ● RAM TRUCK AND THE FCA

Foundation are continuing to support the Texas Ranger Hall of Fame and Museum with a \$100,000 donation, the second such donation Ram has made to the historic law enforcement organization.



## TEXAS TITAN

There was a time when the Chicago Auto Show was the place for the nation's automakers to debut new pickup trucks and SUVs. Now, though, the State Fair of Texas has become the better-or-be-square venue for truck launches. Case in point: Alongside the first public viewing of the new Ford Super Duty trucks and 2016 Chevy Silverado, Nissan had a major presence at the fair to show Texans the new Titan XD fullsize pickup.

“Texas has played a huge role in the development of our all-new Titan trucks,” said Fred Diaz, senior vice president, Sales & Marketing and Operations, USA, Nissan North America. “The initial focus groups took place here, and we've taken it through multiple clinics throughout the state.”

The Titan XD, which goes on sale in December, will be powered by a 5.0L Cummins turbodiesel V-8 producing 555 lb-ft of torque and giving the truck a maximum tow capacity north of 12,000 pounds. It will be offered in three cab configurations, three bed lengths, and five trim levels.





## GM SUSPENSION

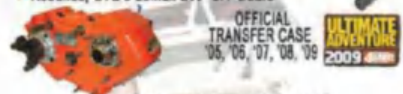
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## DRIVELINES



## RAM NATION

**R**am Truck has created Ram Nation, a way to muster volunteers to help others when disaster strikes. The maker describes Ram Nation as "a grassroots volunteer corps of Ram owners and like-minded people willing and ready to come together to haul supplies, deliver equipment, clear debris, distribute food and water, and even make donations that help people in their communities and around the world." Truck owners interested in volunteering their time can sign up at [ramtrucks.com/ramnation](http://ramtrucks.com/ramnation). Ram Truck and its dealers will access the Ram Nation database to bring volunteers and organizations together when a need or opportunity arises.



## BENTLEY BENTAYGA

I s the Range Rover just not exclusive, pricey, or British enough for you? Then you might be in the market for Bentley's new SUV, the Bentayga. Mechanically it's a beast, with a 6.0L W-12 engine putting out 600 hp and 663 lb-ft of torque, enough twist to propel the 5,300-pound, AWD luxe tourer from 0 to 60 mph in around four seconds.

But a Bentley isn't about raw performance, though that's long been a hallmark of the brand. No, you opt for a Bentley for the amenities: the bull-hide leather upholstery stitched to resemble a British hunting jacket, the hand-selected and -finished wood trim available in seven different veneers, the 15 carpet choices and 17 exterior paint choices, and the available Mulliner Hamper set, which comes with a cooler, fine china, and crystal glass. What does all this British engineering and luxury cost? Well, as they say, if you have to ask...



## LAND ROVER'S TRANSPARENT TRAILER

**L**and Rover is testing a prototype onboard camera system called the Transparent Trailer, which combines video feeds from the vehicle's reversing camera and a camera on each outside mirror with a video from a wireless camera placed on the rear of the trailer. The combined images create one live image that makes the trailer appear see-through. When the trailer is hitched to the tow vehicle, the video feed would automatically appear in the rearview mirror.





## EARTH WATCH

● **SEMA REPORTS THAT THE U.S. DEPARTMENT** of Interior decided that public/private conservation efforts have eliminated the need to list the greater sage grouse as endangered. That win for the birds is a win for us, too, since an Endangered Species Act listing would have led to road and trail closures on the bird's 165-million-acre habitat across 11 western states.

● **SMITTYBILT HAS SIGNED ON AS AN** official partner of Tread Lightly! by contributing at the \$10,000-plus level. As part of Smittybilt's partnership, when the manufacturer's Overlander products, including tents, generators, and Arctic fridges, are purchased from now until the end of 2015, buyers will be awarded a one-year membership in Tread Lightly! paid by Smittybilt.

## CALENDAR

● **JAN. 9-10:** Getting Started Off-Road Driving Clinic by Badlands Off-Road Adventures, Hungry Valley SVRA, Gorman, CA. Info: 310.374.8047, 4x4training.com

● **JAN. 15-17:** Winter Fun Festival by California Four Wheel Drive Association, Nevada County Fairgrounds, Grass Valley, CA. Info: 800.4x4.funn, cal4wheel.com

● **JAN. 16-17:** 18th annual Superstition Mountain Run by San Diego 4 Wheelers, Superstition OHV area near El Centro, CA. Info: sd4wheel.com

● **JAN. 23-24:** Getting Started Off-Road Driving Clinic by Badlands Off-Road Adventures, Borrego Springs, CA. Info: 310.374.8047, 4x4training.com

● **JAN. 23-24:** Discovery (4WD Beginner) Course, Prairie City SVRA, Rancho Cordova, CA. Info: 909.844.2583, discoveroffroading.com

● **JAN. 30:** Getting Started Rock Crawling Clinic by Badlands Off-Road Adventures, Lucerne Valley, CA. Info: 310.374.8047, 4x4training.com

● **JAN. 31:** Winching Clinic by Badlands Off-Road Adventures, Borrego Springs, CA. Info: 310.374.8047, 4x4training.com

● **NOTE:** If you have a 4WD event you want us to publicize, please send the date, location, a description of the event, and contact info—phone numbers and/or email/website address—to Calendar, 4-Wheel & Off-Road magazine, 831 S. Douglas St., El Segundo, CA 90245; fax 818.566.8501; email 4wheeloffroad@enthusiastnetwork.com. Please submit your info at least four months before the event due to our press lead times. 📧

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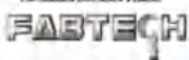
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14-15 Chevy 1500 4WD	6" Knuckle Kit w/ ES Shocks	EXP611948	\$1683.99
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2015 Ram 1500 4WD	6" Stage 1 Kit w/ ES	EXP621018	\$1688.99
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07-15 JK 4 Door	3.5" Lift	EXP631008	\$1111.99

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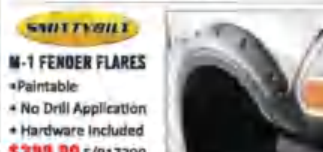
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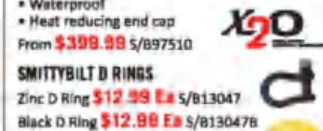


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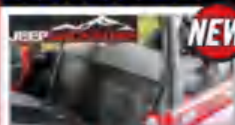
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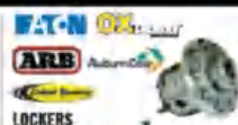


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# READERS' RIDES

## ANNUAL

## ROUNDUP

### OUR FANS STRUT THEIR STUFF

BY Tom Morr

#### SOA FLATTY

**VEHICLE:** 1948 Willys CJ-2A **OWNER:**

Mike Austin, Avondale, AZ **TIRES &**

**WHEELS:** 37x12.50R17 Wrangler

MT/R Kevlars on Hummer H2 wheels

**SUSPENSION:** SOA, 2½-inch BDS

YJ springs, 12-inch Fox 2.0 remote

reservoirs **DRIVETRAIN:** SM465, NP205

with Offroad Design input shaft, Dana

44 front axle, Warn hubs, Dana 60 rear

axle, RuffStuff antiwrap bar, Dutchman

chromoly axles, ARB Air Lockers, 4.56

Yukon gears **PERFORMANCE MODS:**

Chevy 5.7L V-8, 0.030 over, Comp Cams

valvetrain, MSD ignition, TBI, K&N air

cleaner, 2-inch dual exhaust, 50 Series

Flowmaster muffler, Griffin aluminum

radiator **OTHER DOODADS:** Hi-steer/

crossover with Chevy 1-ton tie-rod

ends, Warn winch, ARB onboard air,

full cage (1.75x0.120-inch DOM), Auto

Meter Cobalt gauges, CO<sub>2</sub> setup, custom

frame, body stretched to 103-inch

wheelbase, fullsize spare, homemade

full soft top **DOES EVERYTHING WORK**

**THE WAY YOU WANT?:** Absolutely!

**ANYTHING YOU WOULD CHANGE?:**

Wider wheels, Trail Ready beadlocks

**FUNNIEST WHEELING INCIDENT:** My

friend Max and I drove it to EJS 2015. I

didn't get his window sewn on in time,

so I took mine off too and we froze our

butts off and laughed all the way.



#### HAPPENING DISCO

**VEHICLE:** 2001 Land Rover Discovery II **OWNER:** Josh Roberts,

Newnan, GA **TIRES & WHEELS:** 34x10.5R16 LTBs on black

steel wheels **SUSPENSION:** Roversym 2-inch springs, 1½-inch

spacers, Pro Comp shocks **DRIVETRAIN:** Ashcroft axleshafts,

4.12 Ashcroft ring-and-pinion, front TrueTrac, rear Detroit Locker

**OTHER DOODADS:** Mantec raised intake, roof rack, rear ladder,

Equipe 4x4 front bumper, Roxtar Fab rear bumper, Superwinch

X9 with synthetic line, stainless steel extended brake lines, QT

Services diff guards, Columbia Rovers gas tank skid, Equipe 4x4

steering skid, solid engine mounts, Hella lighting, Roversym rock

sliders **DOES EVERYTHING WORK THE WAY YOU WANT?:** It has

been a slow evolution to its current state, but I am happy with it

**ANYTHING YOU WOULD CHANGE?:** Not at the moment **FUNNIEST**

**WHEELING INCIDENT:** At Uwharrie I was headed downhill. The mud

offered absolutely no traction. Gravity took over until my truck was

stopped by a tree. I cracked my front bumper and lost a headlight.

One simple weld and the bumper was back on duty. **ANYTHING TO**

**ADD?:** I love my Land Rover. It has been a very solid vehicle.







## LIME UNLIMITED

**VEHICLE:** 2013 Jeep Wrangler Unlimited Sahara **OWNER:** Stanton McMinn, Sturgis, MS **TIRES & WHEELS:** 35-inch Toyos on 20x12 Rockstar 2s **SUSPENSION:** 4-inch Rough Country lift **DRIVETRAIN:** Stock **PERFORMANCE MODS:** K&N air filter **OTHER DOODADS:** HID projector headlights with halos, custom bumpers, Warn 8,000-pound winch **DOES EVERYTHING WORK THE WAY YOU WANT?:** More than pleased with this machine **ANYTHING TO ADD?:** Best investment I've ever made. If you're thinking of getting one, do it.



## ALABAMA RENEGADE

**VEHICLE:** 1983 Jeep CJ7 Renegade **OWNER:** Philbert, Auburn, AL **TIRES & WHEELS:** 35-inch Super Swamper SSRs on 15x8 alloys **SUSPENSION:** 4-inch lift, 2-inch body lift **DRIVETRAIN:** 4.88 Yukon gears, rear Detroit Locker **PERFORMANCE MODS:** Weber carb, headers, HEI distributor **DOES EVERYTHING WORK THE WAY YOU WANT?:** Yes, going from 3.73s to 4.88s made a huge difference **ANYTHING YOU WOULD CHANGE?:** Remove some rust, but it comes with an older Jeep **FUNNIEST WHEELING INCIDENT:** Been stuck a few times, but nothing too wild **ANYTHING TO ADD?:** War Eagle



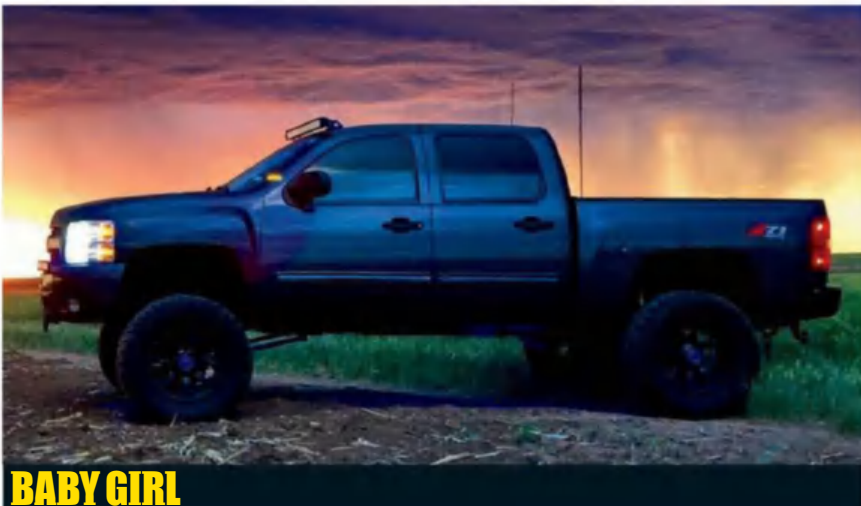
## RED RIDER

**VEHICLE:** 1987 Ford Bronco II Eddie Bauer **OWNER:** Hank Harkey, Garland, TX **TIRES & WHEELS:** 235/75R15 Goodyear Trackers on OEM alloys **SUSPENSION:** 2-inch lift **DRIVETRAIN:** Dana 35 front axle from 1992 Explorer, rebuilt Ranger 7½-inch rear axle, 10-inch brakes, limited-slip, 3.73 gears **DOES EVERYTHING WORK THE WAY YOU WANT?:** Yes **ANYTHING YOU WOULD CHANGE?:** Gonna keep it pretty stock **ANYTHING TO ADD?:** Big upgrade to the Honda ATV it replaced



## JK X

**VEHICLE:** 2009 Jeep JK X **OWNER:** Alex Raymo, Muskegon, MI **TIRES:** 285/70R17 Fierce Attitude MTs **SUSPENSION:** Rock Krawler budget boost with disconnects, stock front springs, 4-door rear springs in back **DRIVETRAIN:** Stock **PERFORMANCE MODS:** Airaid CAI, Bully Dog tuner **OTHER DOODADS:** Yukon 4340 shafts **DOES EVERYTHING WORK THE WAY YOU WANT?:** It works great for what it is **ANYTHING YOU WOULD CHANGE?:** Lockers, more lift, 37s **FUNNIEST WHEELING INCIDENT:** Having water up to the windshield the first week I had it



## BABY GIRL

**VEHICLE:** 2011 Chevy Silverado **OWNER:** Stetson Willis, Shallowater, TX **TIRES:** 37x13.5R20 Toyo M/Ts **SUSPENSION:** 10-inch FTS kit **DRIVETRAIN:** 4.88 gears **PERFORMANCE MODS:** Lifters, cam, heads, Blackbear tune, Edge CTS **OTHER DOODADS:** Optima batteries, Rockford Fosgate subs, Boss amp, two True Blue lightbars **ANYTHING YOU WOULD CHANGE?:** I wouldn't change a thing **ANYTHING TO ADD?:** I'm from Texas. I drive a 4x4. This is my baby girl.

## BAGGED WILLYS

**VEHICLE:** 1948 Willys pickup **OWNER:** Jason Finstad, Tres Pinos, CA **TIRES & WHEELS:** 43-inch Super Swampers on customized Hummer rims **SUSPENSION:** Homemade front 3-link front suspension, rear 2-link with wrist arms, airbags **DRIVETRAIN:** Ford 408 V-8 stroker, C6 transmission, Behemoth Drive BW1356 transfer case with NP205 Doubler, Dana 60 front axle, RCV shafts, Reid knuckles, Ford 10¼-inch rear axle **OTHER DOODADS:** Rollcage built half into the body and under the fenders, Warn 16.5 winch, fully skidplated, heavy-duty driveshafts, full hydro steering, A/C **FUNNIEST WHEELING INCIDENT:** Halfway through a mud pit I found a big hole, making my tires disappear. I floored it, trying to get out before mud got into the engine. Had no doors on. Had to drive home in my underwear.



## JEEP RIVALRY

**VEHICLE:** Red 2013 Jeep JK Rubicon  
**OWNER:** Tom Bristow **TIRES:** 35x12.5R17 BFGoodrich Mud-Terrains **SUSPENSION:** AEV system **DRIVETRAIN:** Stock **OTHER DOODADS:** Warn winch, AEV armor **DOES EVERYTHING WORK THE WAY YOU WANT?:** Yes **ANYTHING TO ADD?:** Hot blonde who likes to wheel

**VEHICLE:** Blue 1983 Jeep CJ-7 **OWNER:** Evan Conklin **TIRES:** 255/75R17 BFGoodrich MTs **SUSPENSION:** 4½-inch Rough Country lift **DRIVETRAIN:** T5 transmission, 4.10 gears, rear ARB Air Locker **PERFORMANCE MODS:** Howell fuel-injection **DOES EVERYTHING WORK THE WAY YOU WANT?:** Yes, it's a CJ and will keep up with all JKs **ANYTHING YOU WOULD CHANGE?:** A/C, YJ brake booster



## CRWLN XJ

**VEHICLE:** 1999 Jeep Cherokee  
**OWNER:** Jesse Soenksen, Lincoln, NE **TIRES & WHEELS:** 35-inch BFGoodrich KM2s on 15x8 fake beadlocks **SUSPENSION:** 6½-inch Rough Country long-arm kit, Bilstein shocks **DRIVETRAIN:** 4.0L I-6, AW4 transmission, NP231 transfer case with SYE, high-pinion Dana 30 front axle, Dana 44 rear axle, Aussie Lockers **PERFORMANCE MODS:** Electric cooling fans, transmission cooler **OTHER DOODADS:** WJ front steering knuckle/steering conversion, KJ rear disc brakes, custom front and rear bumpers, Smittybilt winch, JCR rock sliders, trimmed fenders, chopped and plated rear corners, removable front doors, front frame brace, JCR gas tank skid, TeraFlex rear shackles **DOES EVERYTHING WORK THE WAY YOU WANT?:** It goes where I want it to **ANYTHING YOU WOULD CHANGE?:** Aluminum radiator **FUNNIEST WHEELING INCIDENT:** Was impatient and went out wheeling two days before my rock sliders showed up and put a nice dent right below the passenger door **ANYTHING TO ADD?:** Still amazes me where this thing actually makes it



## JUST ANOTHER TJ

**VEHICLE:** 1997 Jeep Wrangler **OWNER:** Matt Pegan, Mesa, AZ **TIRES & WHEELS:** 35x12.5R15 Goodyear Wrangler MT/R on black steelies **SUSPENSION:** Pro Comp 4-inch lift springs, Rancho RS9000 shocks **DRIVETRAIN:** 32RH transmission, NP231 transfer case with SYE, Dana 30 front axle, Yukon Zip Locker, Ford 8.8 rear axle, mini spool, 4.88 gears, Yukon chromoly shafts **PERFORMANCE MODS:** MagnaFlow exhaust **OTHER DOODADS:** GenRight rollcage, Currie AntiRock front sway bar, JKS adjustable track bar, TNT front winch bumper, Ramsey TripleX 6000 competition winch, custom aluminum rear bumper, Monstalinertub liner, Rigid cube lights, LetzRoll Offroad steering, Poison Spyder hood louvers, Drake hood hold-downs, Poison Spyder steering box skidplate, Warn rock sliders, C&C Fabrication front flat fenders, Solid 8.8 differential cover, Powertank CO<sub>2</sub> tank, Spyderwebshade Krawler top, Corbeau racing seats, Cobra CB radio, Baofeng 2-way radio **DOES EVERYTHING WORK THE WAY YOU WANT?:** Yep, it's a great little rockcrawler **ANYTHING YOU WOULD CHANGE?:** Like most rigs, it is a never-ending project. I'll be picking up a set of new MT/Rs and some beadlocks in the near future. **FUNNIEST WHEELING INCIDENT:** A friend and I were out wheeling and came to a narrow pass that was flooded. He convinced me to back in first so I wouldn't flood the motor if it was deeper than we thought. As soon as I got my rear tires in, the soft sand was like quicksand. I ended up with water up to the steering wheel. It took a good bit of winching to get out. **ANYTHING TO ADD?:** My plan was to make it the most capable I could on 35-inch tires without breaking the bank. I'm really happy with it.



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## PROUD FORD

**VEHICLE:** 2013 Ford F-150 XLT **OWNER:** Mitchell Sommer, Blue Eye, MO **TIRES & WHEELS:** 35-inch Mickey Thompson Baja MTZs on 18-inch Fuels **SUSPENSION:** 6-inch BDS lift **DRIVETRAIN:** Stock **OTHER DOODADS:** American Flag back window tint **DOES EVERYTHING WORK THE WAY YOU WANT?:** Yes, it drives and rides as smooth and easy as when it was stock **ANYTHING YOU WOULD CHANGE?:** Dual exhaust **ANYTHING TO ADD?:** I'd like to thank the guys at Safari Off Road in Nixa, Missouri, for doing such a great job. Go Ford!



## FUTURE SAS-10

**VEHICLE:** 1988 Chevy S-10 Blazer **OWNER:** Ed Mayers, Ashland, KY **TIRES & WHEELS:** Bald set of 31s on stock rims **SUSPENSION:** Cranked-up torsion bars, 2-inch rear shackles **DRIVETRAIN:** Smoky 4.3L V-6, TH700R4 transmission, NP231 transfer case **OTHER DOODADS:** Badlands 9000 winch, Hurst shifter **DOES EVERYTHING WORK THE WAY YOU WANT?:** It does but rides rough **ANYTHING YOU WOULD CHANGE?:** In the process of solid axle swap right now **FUNNIEST WHEELING INCIDENT:** Tried a muddy hillclimb a dozen times and just couldn't make it. My buddy then made it on his first try. So I changed my line, gave it all she had, and barely made it to the top. **ANYTHING TO ADD?:** Thanks, Mike, for the help with my solid axle swap

## THE ANIMAL

**VEHICLE:** 1997 Jeep TJ **OWNER:** Ruben Arrieta, Bellvue, CO **TIRES:** 43x14.5R20 Interco Super Swamper TSL SXs **SUSPENSION:** Custom, Fox coilovers **DRIVETRAIN:** AX15 transmission, Atlas 4-speed transfer case, Unimog axles **PERFORMANCE MODS:** 4.0L I-6, Eaton supercharger **OTHER DOODADS:** Hydroboost steering, ARB refrigerator, air compressor, welder, shower, custom rollcage and canvas top **DOES EVERYTHING WORK THE WAY YOU WANT?:** Yes **ANYTHING YOU WOULD CHANGE?:** Working to add snorkel and CTIS made by myself **ANYTHING TO ADD?:** This project is handmade here in the USA with USA-made products and machines. Hopefully this will inspire those who like to build, not buy.



## JURASSIC GRAND

**VEHICLE:** 1996 Jeep Grand Cherokee Limited **OWNERS:** Bryan & Mollie Kough, Dighton, KS **TIRES & WHEELS:** 33x12.5R15 BFGoodrich Mud-Terrain T/As, Pacer Rims **SUSPENSION:** 4-inch lift, JKS springs, Skyjacker shocks **DRIVETRAIN:** Stock **PERFORMANCE MODS:** MSD ignition, K&N intake **OTHER DOODADS:** Bedliner on fenders, lower half of doors, and on hood and roof; painted to replicate the *Jurassic Park* Wranglers **DOES EVERYTHING WORK THE WAY YOU WANT?:** Not quite. I am looking to replace the rear axle due to spider gears welded from previous owner. **ANYTHING YOU WOULD CHANGE?:** Cage, winch, fix the A/C **FUNNIEST WHEELING INCIDENT:** We were exploring a dry section of the Arkansas River near Cimarron, Kansas, when we spotted a large puddle. We thought it wouldn't be

that deep. However, as soon as we got to the middle of the puddle we discovered how soft the bottom was and water started coming through the bottom of the doors. We gunned it, and mud and water completely covered the windshield as our three boys in the back seat whooped and hollered. Once we got farther down the riverbed we rolled our windows back down. As the branches whipped the sides of the Jeep, cottony seeds flew in, covering the kids and their car seats! Our 18-month-old was incredibly unhappy with the flying fluff. **ANYTHING TO ADD?:** The reason for the Jeep being painted *Jurassic Park* theme was for our sons to enjoy it when we camped and made trips to Colorado. Everywhere we go people point at it, take pictures with their phones, and give us a thumbs-up. We are also planning to take a dinosaur-themed trip this summer to the Dinosaur National Monument on the Colorado-Utah border.





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## OLD-SCHOOL K5

**VEHICLE:** 1974 Chevy K5 Blazer **OWNER:** Gilbert Gonzalez, Los Angeles, CA **TIRES & WHEELS:** 33x12.5R15 BFG All-Terrains on American Racing wheels **SUSPENSION:** Front add-a-leaf, rear Offroad Design 4-inch shackle flip, Rancho shocks **DRIVETRAIN:** TH350 with a B&M shift kit, NP203 with a part-time conversion, stock rebuilt 1/2-ton axles, 3.73 gears **PERFORMANCE MODS:** Chevy 350 V-8, 268XE Comp cam and valvetrain, Edelbrock Performer intake, Holley 650 4-barrel carb, Sanderson headers, DUI distributor **DOES EVERYTHING WORK THE WAY YOU WANT?:** So far, yes **ANYTHING YOU WOULD CHANGE?:** SM465, NP205, 1-ton axles, 4.11 gears **FUNNIEST WHEELING INCIDENT:** First time out got stuck going up a soft dirt trail because I forgot to leave the truck in First **ANYTHING TO ADD?:** Can't wait to get her out in the dunes



## JAMER-IN' JEEP

**VEHICLE:** 2004 Jeep Wrangler Rubicon **OWNER:** Benjamin Jamer, Gilbert, AZ **TIRES & WHEELS:** 35-inch Goodyear Wrangler MT/Rs on Pro Comp 8089 Xtreme Alloys **SUSPENSION:** 4 1/2-inch Rubicon Express long-arm kit, 1 1/2-inch body lift **DRIVETRAIN:** 42RLE transmission, NP2410R transfer case, Dana 44s **OTHER DOODADS:** Vlair onboard air, Smittybilt XRC10 winch, sPod switch panel, TBT sport cage, MetalCloak front fenders, Smittybilt XRC front bumper, Rampage rear bumper **Yes ANYTHING YOU WOULD CHANGE?:** I would like to upgrade axles/gearing and I can dream about a Hemi swap **FUNNIEST WHEELING INCIDENT:** There was this one up-and-over rock that even the crawlers were having a hard time getting over. I decided to give it a try and ended up picking the right line and making it up and over in one try.



## SHORT BUS

**VEHICLE:** 2000 Nissan Xterra **OWNER:** Steve Ollis, Marion, NC **TIRES & WHEELS:** 265/75R16 front Summit Mud Hogs, rear 265/75R16 Cooper STTs on 2004 Xterra aluminum wheels **SUSPENSION:** 3-inch leveling kit, Toyota T100 Rough Country shocks **DRIVETRAIN:** Stock **PERFORMANCE MODS:** K&N intake **OTHER DOODADS:** Lunch Box locker in the rear, Smittybilt bumper, Rough Country 20-inch dual LED bar, Smittybilt 48-inch Hi-Lift jack, roof cage, Sony Xplode sound system **DOES EVERYTHING WORK THE WAY YOU WANT?:** Yes, it gets me in and out like a champ **ANYTHING YOU WOULD CHANGE?:** Front axle swap, 4-link in the rear, 3-inch body lift, ARB Air Lockers **ANYTHING TO ADD?:** My Xterra used to be my mom's old short bus and has been a lot of fun to work on and play in. If you're looking for a 4x4 that can do a lot straight out the box, they are a great ride.



## MUDDERADO

**VEHICLE:** 2006 Chevy 1500 HD **OWNER:** Daniel Wythe, Grande Prairie, Alberta, Canada **TIRES & WHEELS:** 315/75R16 Nitto Mud Grapplers on 16x10 Ions **SUSPENSION:** 7-inch BDS high-clearance kit, BDS 5000 shocks **DRIVETRAIN:** 4L80E transmission, front AAM 9 1/2-inch IFS differential, 14-bolt rear axle, Detroit Locker, 4.11 gears, upgraded rear driveshaft **PERFORMANCE MODS:** 6.0L V-8, AFE cold air, Hedman headers, MagnaFlow exhaust with dual 2 1/2-inch mufflers **OTHER DOODADS:** ARB front bumper, Warn M12000 winch, Sirius LED off-lights, Truxedo box cover, Cognito steering linkage, Line-X on rockers and fender flares, tons of recovery gear and tools **FUNNIEST WHEELING INCIDENT:** Taking a girl on our first date, we went 4-wheeling, broke down, and had to hike two hours to get to cell service **DOES EVERYTHING WORK THE WAY YOU WANT?:** It is my daily driver that has held up really well. It can go from tough 4-wheeling to long highway days and everything in between. **ANYTHING YOU WOULD CHANGE?:** Supercharger, JD Fab midtravel coilover suspension kit, roof rack, hydraulic bumpstops **ANYTHING TO ADD?:** I started reading in 1996 when I was only 10 years old and have kept them all. Thank you for all the hard work and entertainment. It's my dream to go to Ultimate Adventure someday.



## NC TJ

**VEHICLE:** 1999 Jeep Wrangler **OWNER:** Joshua Friday, Cramerton, NC **TIRES & WHEELS:** 35-inch Nitto Trail Grapplers on 17-inch Rockstar 2s **SUSPENSION:** 4-inch Rough Country N2.0 lift **DRIVETRAIN:** Dana 30 front axle, Ford 9-inch rear axle, limited-slip, chromoly shafts, 4.88 gears **FUNNIEST WHEELING INCIDENT:** In Uwharrie National Forest, I took an aggressive line, dropped it on a rock way too big for my Jeep, and dented the bottom of the tub. I pressed on and kept going and put a massive dent in my gas tank to where it now only holds 15 gallons. Also busted a Kevlar sidewall. Everyone was dumbfounded, but it was a good day overall. **DOES EVERYTHING WORK THE WAY YOU WANT?:** To some extent **ANYTHING YOU WOULD CHANGE?:** Custom headlights, Poison Spyder sliders





## HITTING THE APEX

**VEHICLE:** 2002 Jeep TJ Apex Edition  
**OWNER:** James Carpenter, Central Point, OR  
**TIRES & WHEELS:** 33x12.5R15 BFGoodrich KM2s on Methods **SUSPENSION:** Pro Comp 4-inch Stage 2 short-arm lift **DRIVETRAIN:** G2 Dana 44 axles, 30-spline chromoly shafts, 4.10 gears, Eaton E-Lockers, CV driveshafts  
**PERFORMANCE MODS:** Rebuilt 4.0I-6, AirAid intake and throttle body spacer, Banks Torque Tube header and Monster exhaust **OTHER DOODADS:** Smittybilt XRC bumpers and rock sliders, CSI 8500 winch with synthetic rope, CSI 20-inch light bar, Hi-Lift jack, ARB onboard air compressor, Delta Xenon headlights, Drake shifter **ANYTHING YOU WOULD CHANGE?:** Add Fox 2.0 shocks **ANYTHING TO ADD?:** Get out and explore the unknown!



## RAGTOP BLAZER

**VEHICLE:** 1972 Chevy K5 Blazer **OWNER:** Leslie Woolington, Sturgis, MS **TIRES & WHEELS:** 36-inch Super Swampers TLSs on old-school 16.5-inch slot mags **SUSPENSION:** 2½-inch front Skyjacker lift springs, rear 56-inch 1-ton junkyard springs with a few leaves taken out, custom mounts, about a 7-inch lift, Pro Comp shocks **DRIVETRAIN:** PTC TH400 transmission, NP205 transfer case, Dana 60 front axle, Lock-Rite, Chevy 14-bolt rear axle from an M1008 **PERFORMANCE MODS:** Half worn-out 1991 Chevy 350 V-8, Holley Truck Avenger carb, Edelbrock intake **OTHER DOODADS:** 1970 grille, Lock crossover steering, rear disc brakes, hydroboost **DOES EVERYTHING WORK THE WAY YOU WANT?:** Definitely **ANYTHING YOU WOULD CHANGE?:** New motor with more horsepower **FUNNIEST WHEELING INCIDENT:** Bystander at Hawk Pride in Alabama told us he knew it was about to get serious when the passenger sacrificed the Solo cup in hand to hold on better **ANYTHING TO ADD?:** Shout out to my son Seth, who puts up with all this while thinking his mama is crazy, and my husband, Randy, who is wonderful and has mad fabricating skills that makes all this even possible—Morgantown Mafia!



## DOOM

**VEHICLE:** 1986 Jeep Cherokee **OWNER:** Anthony Steineke, Rockford, IL **TIRES & WHEELS:** 35x12.5R15 Interco LTBs on 15-inch steelies with TMI beadlocks **SUSPENSION:** Clayton Off-Road long arms, 5½-inch Rubicon Express coils, 4½-inch Otto-Max leaf springs, TeraFlex shackles, HD Off Road shackle relocation brackets **DRIVETRAIN:** TF904 transmission, swapped-in NP231 transfer case with JB Conversions SYE, DIY 6-gear planetary and wide chain set, Novak shifter, swapped-in Dana 30 front axle, Warn hub conversion, chromoly outers, Chrysler 8¼ 29-spline rear axle, 4.56 Yukon gears, Tom Wood's rear driveshaft, shortened Explorer front driveshaft **PERFORMANCE MODS:** 2.8L V-6 of Doom! **OTHER DOODADS:** Aries front TJ stubby bumper, custom rear bumper, RuffStuff frame stiffies, RuffStuff Heim steering, RuffStuff diff covers, Artec Dana 30 truss with Johnny Joints, JCR transfer case skid, Farmboy taillight boxes, hybrid cage, 2x6 rockers, 16-gallon Jazz fuel cell, Brown Dog motor mounts **DOES EVERYTHING WORK THE WAY YOU WANT?:** Yes **ANYTHING YOU WOULD CHANGE?:** Atlas transfer case, coilovers **FUNNIEST WHEELING INCIDENT:** Anytime the 2.8L does something you can't **ANYTHING TO ADD?:** Yes, I took the worst XJ platform and made it into a respected trail rig. Yes, I'd do it again!



## SPORTY XJ

**VEHICLE:** 2000 Jeep Cherokee Sport **OWNER:** Tyler Coleman, Syracuse, NY **TIRES & WHEELS:** 33x12.5R15 Mickey Thompsons on Black Rock Vipers **SUSPENSION:** 6½-inch Rough Country long-arm kit **DRIVETRAIN:** 4.0LI-6, AW4 transmission, NP231 transfer case with Advance Adapters SYE, Dana 30 front axle, Chrysler 8¼ rear axle **PERFORMANCE MODS:** Custom cowl intake, Banks cat-back exhaust **OTHER DOODADS:** Rusty's Offroad sliders, Affordable Offroad bumpers with custom tire carrier, MTX stereo, 30-inch LED light bar, Rigid backup lights **FUNNIEST WHEELING INCIDENT:** Knocked the A-pillar into a tree and ripped off a fender flare within one minute of each other **DOES EVERYTHING WORK THE WAY YOU WANT?:** So far **ANYTHING YOU WOULD CHANGE?:** Higher-clearance fender flares **ANYTHING TO ADD?:** My dad and I built this from stock to where it is now. I'm 21 and still in school but always make time to read the magazine.





## UNLIMITED LIMITED

**VEHICLE:** 1999 Jeep Cherokee Limited  
**OWNER:** Anthony Bouchard, Hudson, FL **TIRES & WHEELS:** 33x12.5R15 Cooper Discoverer STT Pros on 15x10 Cragar V5s **SUSPENSION:** 7½-inch custom lift, BDS springs, Rough Country control-arm drop brackets, shackle relocation kit, Bilstein 5100 shocks, JKS swaybar disconnects **DRIVETRAIN:** 4.0L I-6, AW4 transmission, NP242 transfer case, Dana 30 high-pinion front axle, Chrysler 29-spline 8¼ rear axle **PERFORMANCE MODS:** Hayden transmission cooler, Banks cat-back exhaust **OTHER DOODADS:** Durango 136-amp alternator, ZJ tie-rods, Neon 784 fuel injectors, TruckLite LED headlights, 50-inch LED light bar, Rough Country winch bumper, 12,000-pound winch **DOES EVERYTHING WORK THE WAY YOU WANT?:** Almost **ANYTHING YOU WOULD CHANGE?:** 4.56 axle gears, 4.7L V-8 stroker



## PRISTINE PONY

**VEHICLE:** 1966 Ford Bronco **OWNER:** James Vorderlandwehr, Wichita, KS **TIRES & WHEELS:** 37-inch Super Swamper M-16s, Total Metal Innovations weld-on beadlocks **SUSPENSION:** James Duff 2-inch body lift, 5½-inch four-link rear suspension lift, 5½-inch front lift, extended radius arms **DRIVETRAIN:** Stock, three on the tree **OTHER DOODADS:** Custom bumpers, 6-point rollcage, Line-X interior **DOES EVERYTHING WORK THE WAY YOU WANT?:** Yes **ANYTHING YOU WOULD CHANGE?:** 5.0L Coyote **ANYTHING TO ADD?:** My 10-year-old son, Isaac, can't wait to get his license and drive it



## JJ'S YJ

**VEHICLE:** 1990 Jeep YJ **OWNER:** JJ Ormond, Southold, NY **TIRES & WHEELS:** 37x12.5R16.5 Interco Irok radials on recentered H1s **SUSPENSION:** Rubicon Express SOA springs tucked and frenched into frame with slider boxes, just 2 inches of lift, 11¾-inch-travel Bilstein 5100 shocks **DRIVETRAIN:** 700R4 transmission with full manual valve body, NP231 transfer case with Dana 300 Doubler with JB Conversions HD outputs, high-pinion kingpin Dana 60 front axle, Detroit Locker, full-floating Chevy 14-bolt rear axle, ARB Air Locker **PERFORMANCE MODS:** Chevy 350 V-8 stroker, torquer cam, roller valvetrain, Air Flow Research heads, ACCEL TPI intake, ACCEL DFI engine management **OTHER DOODADS:** CJ-7 front clip, 3-inch front stretch, 4-inch rear stretch, flat belly skids, Warn 8274 winch, homemade fenders and bumpers **DOES EVERYTHING WORK THE WAY YOU WANT?:** For the most part. There is always something I could make better. **ANYTHING YOU WOULD CHANGE?:** Swap out the old small-block for a bone-stock 6.0L LS motor and build a proper cage. Someday stretch it to fit an LJ top for more storage space. **FUNNIEST WHEELING INCIDENT:** Listening to one of the passengers in our group psyching out another passenger so he could ride shotgun on a pucker-inducing trail obstacle **ANYTHING TO ADD?:** Love the magazine, the only one I spend money on



## BACK 40 XJ

**VEHICLE:** 1991 Jeep Cherokee **OWNER:** Royal Whitehead, Casa Grande, AZ **TIRES & WHEELS:** 37x12.5R15 Goodyear MT/Rs on 15x8 Pro Comp Soft 8s **SUSPENSION:** 5½-inch Rubicon Express coils, Rough Country adjustable lower control arms, Rough Country N2.0 shocks, F-250 rear leaf springs **DRIVETRAIN:** 4.0L I-6, AW4 transmission, NP231 transfer case with Rugged Ridge SYE, Dana 30 front axle, Spartan locker, Chrysler 8¼ rear axle, welded **PERFORMANCE MODS:** Dodge Neon injectors **OTHER DOODADS:** Full cage, winch bumper **DOES EVERYTHING WORK THE WAY YOU WANT?:** Yes, it has gotten me through every obstacle I need to **ANYTHING YOU WOULD CHANGE?:** Long arms, high-pinion Dana 44 front axle, Dana 60 rear axle





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## OAKLEY EDITION K20

**VEHICLE:** 1972 Chevrolet Cheyenne K20 **OWNER:** David Oakley, Fresno, CA **TIRES & WHEELS:** 39.5R13x17 Interco Iroks on Mickey Thompson Classic IIs **SUSPENSION:** 14-inch custom springs, Pro Comp shock, 3-inch body lift **DRIVETRAIN:** Turbo 400 transmission, divorced twin-stick NP205 transfer case, Dana 60 front axle, 14-bolt rear axle, Detroit Locker, 4.56 gears **PERFORMANCE MODS:** Chevy 468 V-8 big-block stroker (600 hp, 734 lb-ft) **OTHER DOODADS:** Crossover steering, Auto Meter gauges, in-cab snorkel, removable mud proofing panels **DOES EVERYTHING WORK THE WAY YOU WANT?:** Sure does! **ANYTHING YOU WOULD CHANGE?:** No **ANYTHING TO ADD?:** Front traction aid, bumpers, winch



## HAMMY GRAND

**VEHICLE:** 1994 Jeep Grand Cherokee **OWNER:** Ed Giesen, Wichita, KS **TIRES & WHEELS:** 285/75R16 Mastercraft MTRs on 1998 Grand Cherokee wheels **SUSPENSION:** 4½ inches of lift—1990s F-150 front coils, Skyjacker shocks, Rubicon Express adjustable control arms, JKS adjustable track bars **DRIVETRAIN:** AW4 transmission, NP231 transfer case with hack and tap SYE, Dana 30 front axle, 4.10 gears, Ford 8.8 rear axle, 4.11 gears, limited-slip, Iron Rock bracket kit **OTHER DOODADS:** Owner-built rock/rub rails, skids, roof rack, front winch mount; 75-watt Ham radio, automatic position reporting system; 2,000-watt inverter, onboard air **DOES EVERYTHING WORK THE WAY YOU WANT?:** Great all-purpose rig **ANYTHING YOU WOULD CHANGE?:** Needs lockers **FUNNIEST WHEELING INCIDENT:** A friend was bringing a towstrap down to me on a steep hill. He lost his footing and ended up running past my rig (gave it a high-five as he ran by) all the way down the hill to the bottom. **ANYTHING TO ADD?:** Not the biggest of rigs but it works



## ROCKIN' WRANGLER

**VEHICLE:** 2000 Jeep Wrangler **OWNER:** Roy Mayberry, Pensacola, FL **TIRES:** 35x12.5R15 Mud Claw MTs **SUSPENSION:** 4-inch Teraflex short-arm suspension kit, Teraflex 9550 shocks, Rough Country stabilizers **DRIVETRAIN:** 5-speed manual transmission, Dana 30 front axle, Detroit Locker, Dana 35 rear axle, Eaton E-Locker, Superior 30-spline chromoly shafts, 4.56 gears **OTHER DOODADS:** CC Fabs stubby front fenders, custom front bumper, flush-mount LED lighting **FUNNIEST WHEELING INCIDENT:** The time I snapped my driver-side stock rear axleshaft and my tire passed me up **DOES EVERYTHING WORK THE WAY YOU WANT?:** Jeep works just the way I want—low center of gravity, wide stance, and light weight **ANYTHING YOU WOULD CHANGE?:** Rear selectable locker, sliders, skids, and full cage



## HAWAIIAN BRUTE

**VEHICLE:** 2014 Rubicon/AEV Double Cab **OWNER:** Ed Elms, Kaneohe, HI **TIRES & WHEELS:** 37x13.5R17 Toyo Open Country MTs on 17x8.5 AEV Pintler beadlocks **SUSPENSION:** AEV 4½-inch Dualsport RS, 5160 Bilstein remote-reservoir shocks **DRIVETRAIN:** 5.7L Hemi, front Dynatrac Pro Rock 44 axle, rear Dynatrac Pro Rock 60, RCV chromoly shafts, ARB Air Locker, 4.88 gears **PERFORMANCE MODS:** K&N intake, Flowmaster exhaust **OTHER DOODADS:** Reid Racing knuckles, Synergy chromoly steering linkage and brace, JE Reel driveshafts, sPod with G-Screen, Genesis dual battery kit with Optimas; Warn 9.5 CTi winch with Masterpull line, Poison Spyder Crusher Flares, custom DOM rollbar and rocker rails, IPF lights, Corbeau Baja XRS seats, AEV snorkel **DOES EVERYTHING WORK THE WAY YOU WANT?:** Yes indeed! **ANYTHING YOU WOULD CHANGE?:** 6.4L Hemi **FUNNIEST WHEELING INCIDENT:** Burned a hole in my airline to the rear locker, melted several wiring looms during an 8,000-foot hillclimb in the Inyo Mountains on a 102-degree day (those Hemis get warm!) **ANYTHING TO ADD?:** My wife doesn't understand the affliction of off-roading





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**PART 3:  
WE CHOOSE TRACKER  
DRIVETRAIN COMPONENTS (TWICE)**

# LEARN FROM OUR MISTAKES

**By Harry Wagner**  
**PHOTOGRAPHY HARRY WAGNER**

**I**T HAS BEEN MONTHS SINCE WE wrote an update on our Chevy Tracker project affectionately known as the Jet Puff (July '15). Life has put this project on the back burner, but it hasn't been completely abandoned. It has changed direction a few times though, which is the curse of a project that takes too long to complete. If Goldilocks were building a rig, she would want to take enough time so that no corners were cut but not so long that she got distracted by the latest and greatest new widget. Shiny widgets weren't the problem here, but we have made some unforced

errors on the Jet Puff that set us back and added unnecessary expense. Originally we started with a 4WD Tracker with a 1.6L engine and purchased a Toyota Land Cruiser 80 Series front axle and 4Runner rear axle. None of those parts remain now, with the exception of some of the front axle components like hubs and spindles. The intent is for this to be a budget project, but the best way to save money is to not spend it twice. Now we have a 2WD Tracker with a 2.0L engine, a divorced Samurai transfer case from Trail Tough, and Toyota-based Diamond axles.

Why Toyota-based axles? There are several factors when deciding what drivetrain components to run, but perhaps none is more important than tire size. If you intended to run 40-inch-tall tires, consider

1-ton axles mandatory. Similarly, if you only plan to run 33-inch-tall tires, 1-tons will just result in getting the diff hung on every rock on the trail due to a lack of ground clearance. In the case of the Jet Puff, we plan to run 37-inch-tall Maxxis Trepadors on KMC Enduro beadlock rims. We consider 37s at the upper limit for half-ton axles, depending on other factors like driving style, gearing, vehicle weight, and horsepower. Of course, all half-ton axles are not the same, and thanks to RCV, Nitro Gear & Axle, Diamond Axle, and Spidertrax, the axles we put under our Tracker offer strength that rivals 1-ton components without the weight or ground clearance penalties. If only we had turned to these companies from the start; we could have saved ourselves a lot of time and money.





**1** There are more powerful engines, and lighter engines, than the 225-pound 2.0L engine in our Tracker. The engine and transmission are the only drivetrain components we are retaining though, and doing so retains reliability and keeps an already large-scale project from becoming even more expensive and time consuming. The 2.0L engine makes 130 hp and 134 lb-ft of torque in stock form.

**2** During the build we also performed some preventive maintenance on our new-to-us Tracker since we didn't know what it had been subjected to in its previous life. The timing chain was replaced with a stock replacement part from RockAuto, along with new spark plugs, belts, and hoses.

**3** We retained the factory five-speed transmission but added a new Exedy clutch



from RockAuto and resurfaced the flywheel. The M59 transmission only weighs 75 pounds, compared to 110 pounds for an AX15 or 195 pounds for an NV4500. The downside of the M59 is that First gear is a mere 3.65:1, so we will need to get our gearing in the transfer case and differentials.

**4** There are a lot of great transfer case options on the market, from the Advance Adapters Atlas II to Dana 300s and Toyota transfer cases. None of them are nearly as light as the 52-pound Samurai transfer case that we ordered from Trail Tough. The 6.4:1 Trail Tough Rockmonster gears offer the gear reduction we need, and they even lower the high range ratio by 17 percent, effectively turning our 5.29 Nitro gears into 6.19s.

**5** Both axle housings were replaced with fabricated Diamond Axle housings that are



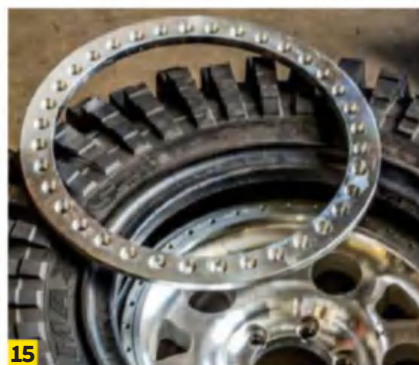
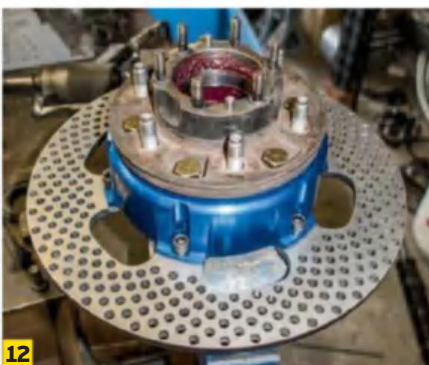
stronger than the stamped factory housing and increase ground clearance by  $\frac{3}{4}$  inch under the differential. Diamond typically constructs the housings with 3-inch,  $\frac{3}{8}$ -wall DOM axletubes, but we opted for  $\frac{1}{4}$ -wall tubes in order to shave approximately 15 pounds from each housing.

**6** We hesitate to call Nitro Gear "Toyota specialists" because the company makes many parts for many other applications too. Nitro does make some unique Toyota components though, such as the big spline gear kits, which upgrade the pinion on 8-inch applications from 27 to 29 splines. We are running Nitro's 5.29 ratio ring-and-pinions front and rear.

**7** Toyota offered selectable lockers on a number of factory applications, including Tacomas, 4Runners, and Land Cruisers. We are using the high-pinion front differential from a Land Cruiser and the rear differential from a Tacoma. These lockers use an electronically controlled shift fork that is both robust and simple in operation.

**8** We started with an FJ80 Land Cruiser front axle, which was upgraded with Hellfire Fabworks knuckles in Part 1 (June '15). We paid as much for this front axle as you would expect to pay for a used Dana 60 front axle, but in retrospect that may have been a mistake, as the only original components that were retained were the third member, spindles, and hubs.





**9** The factory Birfields and axles were upgraded to RCV chromoly Birfields and 300M axleshafts (RCV also offers chromoly axle shafts). In addition to being made from stronger materials, the RCV axle shafts are 30-spline at the Birfield instead of the stock 24 splines.

**10** “Those factory brakes look pretty heavy,” Jesse Haines noted. We had never thought about changing the brakes to save weight, but Haines sees a lot of things that the average wheeler would miss. We will be replacing the vented rotors and cast calipers with Spidertrax cross-drilled rotors, aluminum hats, and light-weight aluminum calipers.

**11** Spidertrax makes its brakes to match the unit bearings the company uses with its Spider9 axles, so Jesse Haines had to do some machine work in order to mate our Land Cruiser hubs to the Spidertrax brakes.


**12** The back of the Land Cruiser hub was machined flat in order to mate it to the Spidertrax brake hat. The holes in the hat were larger than the mounting holes on the hub, so we used Grade 8 hardware, flat washers, and thread-locking compound to ensure that the hub and the rotor were safely mated together.

**13** 80 Series Land Cruiser axles come with drive flanges, but we swapped to Aisin hubs in order to allow us to unlock the hubs

and drive the Jet Puff on the street. This might seem like a step backwards in terms of strength, but the addition of 300M hub gears from RCV ensures that we will never have to worry about hub strength again.

**14** In the rear we will be running another Diamond axle fitted with a Toyota electric locker, 5.29 Nitro gears, and Spidertrax light-weight brakes. Our application uses an offset differential to match the output of the Samurai transfer case, so custom axle shafts are neces-

sary. Diamond used Ford 9-inch big bearing housing ends that allow us to source custom axle shafts from a variety of sources.

**15** The axles will be capped by 37-inch Maxxis Trepador tires mounted on great-looking KMC Enduro beadlocks. Mounting the tires up was more difficult than past beadlocks we have installed, but we attribute this to the strong, stiff bias-ply sidewalls on the Maxxis tires. 

“The best way to save money on a project is not to spend it twice”

## SOURCES

**DIAMOND AXLE**  
970.881.2418  
diamondaxle.com

**HELLFIRE FABWORKS**  
619.395.0665  
hellfire-fabworks.com/

**JESSE HAINES FABRICATION**  
facebook.com/jesse.haines.12

**KMC WHEELS**  
kmcwheels.com

**MAXXIS TIRES**  
maxxis.com

**NITRO GEAR**  
916.673.6464  
nitro-gear.com

**RCV PERFORMANCE PRODUCTS**  
815.877.7473  
rcvperformance.com

**ROCKAUTO**  
866.ROCKAUTO  
rockauto.com

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sleeoffroad.com

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# 4BT-40

by Harry Wagner

PHOTOGRAPHY HARRY WAGNER

**T**HE DOWNSIDE OF WHEELING A rig on hardcore trails is that it can slowly destroy your pride and joy with every scrape and dent. Rather than scrap his project and start over, Chris Glass just keeps rebuilding his FJ40 Land Cruiser, making it better each time. Over the past 12 years those upgrades have included stretching the frame and body by 18 inches, adding 1-ton axles, and installing a built small-block Chevy. During his last round of upgrades, Chris ditched the V-8 in favor of a four-cylinder for better fuel economy.

This isn't just any four-cylinder though. The engine Chris chose was the mighty Cummins 4BT. Equipped with a modified fuel pump, larger injectors, and compound turbos, the engine makes far more torque than the small-block did—and gets double the fuel mileage. The end product makes short work of most trails and sounds awesome doing it. We have to confess that we were kind of hoping Chris would roll his Cruiser just so we can see what he comes up with in his garage next!

## TECH SPECS

### 1967 TOYOTA LAND CRUISER

#### >DRIVETRAIN

**ENGINE:** Cummins 4BT

**TRANSMISSION:** TH400 3-speed automatic

**TRANSFER CASE:** Offroad Design Doubler with NP203 and NP205

**FRONT AXLE:** Dana 60 with 4.88 gears, ARB Air Locker, Yukon chromoly axleshafts and Super Joints, and Dynatrac Dynaloc hubs

**REAR AXLE:** Shaved Corporate 14-bolt with 4.88 gears and Detroit Locker

#### >SUSPENSION

**SPRINGS & SUCH:** Triangulated 4-link with King coilovers (front and rear)

**TIRES & WHEELS:** 44X19.50-15LT Pit Bull Rockers on 15x12 steel rims with Twisted Metal rock rings

**STEERING:** Crossover steering with AGR box, PSC pump, and industrial hydraulic assist ram

**OTHER STUFF:** Warn 8274 winch, custom fuel cell, AutoMeter gauges, Tuffy Security console

## CUMMINS-POWERED LAND CRUISER









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Courser XMT M/T Buckshot II Bogger M16 Irok TSL Radial/Bias XMT2 Trailblade Couragia



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of suspension kits



ACCESSORIES






## “This isn’t just any four-cylinder”

**1** Power comes from a 4BT Cummins engine equipped with a modified VE pump and larger injectors. The engine was built by Douglas Machine with A1 head studs and DFI 5x0.014 SAC injectors. Owner Chris Glass built all the plumbing for the Hx30w/Hx35w compound turbos and huge front-mount intercooler. From there, power is routed to a TH400 transmission with a low-stall torque convertor and an Offroad Design Doubler.

**2** The triangulated four-link suspension provides ample articulation, but it also generates a lot of bumpsteer with the crossover steering. Chris plans to add full hydro steering in the future to the Dana 60 front axle. It uses 4.88 gears; an ARB Air Locker; Yukon chromoly axleshafts and Super Joints; and Dynatrac Dynaloc hubs to live between the diesel engine and huge 44-inch Pit Bull Rockers.

**3** The rear axle is a shaved Corporate 14-bolt with an Artec pinion guard. Behind the Crane diff cover, a set of 4.88 gears is bolted to the Detroit diff. Note the V-shaped fuel tank that was built by Jeremy Nordin to hold 21 gallons of diesel fuel and clear the differential at full compression.

**4** The suspension consists of triangulated four-links with 2½-inch-diameter, 14-inch-travel King coilovers front and rear. The front uses 300- over 400-lb/in springs, and the rear uses softer 250- over 350-lb/in ones. The links are constructed from 1½x0.500-wall drill steel with ¾x6-inch Rubicon Express joints and connect to a custom truss in front and an Artec truss in the back. The rear suspension also has a Speedway Engineering sway bar to add stability in off-camber situations.

**5** Chris built his own rollcage for his stretched FJ40 from 1¾x0.120-wall tubing to protect his entire family. Junkyard Honda seats straddle a Tuffy console behind the B&M shifter for the TH400. Chris recently added AutoMeter gauges on the cage crossbar to monitor exhaust temperature, boost pressure, and transmission temperature to match the other AutoMeter gauges he had previously installed in the dash. 



1



2



3



5



4



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METRIC	67904/69279	\$49.99
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Item 69560 shown

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LOT 62539 32888 shown

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SIZE	LOT
MED	68496/61363
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X-LG	68498/61359

Customer Rating 

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**Customer Rating** ★★★★★

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**SAVE \$68** comp at \$168.97

**LOT 91616 shown 69087/60379**

**Drill 28 Hole Sizes**

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**LOT 60497/93888 shown 61899/62399**

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# BFGs TO BODIE



by Harry Wagner

PHOTOGRAPHY HARRY WAGNER

**B**ODIE IS A GHOST TOWN IN A state of arrested decay on the eastern slope of the Sierra Nevada Range in California. After the Gold Rush of 1849, miners started looking for the next big thing, and they found it in the Comstock Lode of Virginia City, Nevada. Bodie is just 100 miles south of Virginia City, well within the effects of the Comstock boom. In the 1880s the population was over 10,000 and the town produced over \$15,000 in gold.

We were looking for the next big thing ourselves, so we mounted up BFGoodrich's latest All-Terrain tire on our 2006 Jeep Wrangler Rubicon and 1996 Toyota Tacoma and headed from Virginia City down to Bodie to give the tires a proper test. Bodie was a cutting-edge, innovative town, acting as the first town to harness hydroelectric power. In fact, back in 1892 when the power lines were built, they were in a straight line because it was feared that electricity could not travel around corners! BFGoodrich knows plenty about innovation and traveling around corners. The company practically invented the all-terrain tire segment back in 1976. While not quite as old as the town of Bodie, the BFGoodrich All-Terrain T/A has been a staple in the light truck market.

Something else that Bodie and BFG share is ingenuity. Assayer Lester Bell perfected the cyanide process to safely extract gold from tailings, and BFG recently updated the A/T to KO2 specifications to stay ahead of the competition. It must have worked; the company sold one million of the new KO2s during the first eight

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⚙️ The rubber used in the KO2s was formulated to reduce chips and tears for superior gravel road endurance. The tire also has special stone ejectors that push objects out of the tread, reducing drilling into the tire. All combined with BFG's famous interlocking tread for excellent stability.

⚙️ The 285/70R17 (33-inch tall) BFGoodrich All-Terrain T/A KO2s that we tested on our LJ are rated Load Range E, making them suitable for a 1-ton truck. We aired the tires down to 18 pounds once we left pavement to allow the carcass to conform to the terrain and smooth out the ride. Upon returning to the tarmac we aired the tires back up to 35 psi.

months of production, effectively turning rubber into gold. The new KO2 looks very similar to the outgoing KO tire, but there are several notable changes in that familiar-looking package. Sidewall strength has been increased 20 percent, tread life on pavement has gone up 15 percent, and tread life on gravel roads has doubled.

This last improvement was of particular interest to us, as our trip to Bodie started on dirt backroads that had recently been graded. Sounds great, right? While the roads were free of washboards, in our experience freshly graded roads unearth sharp rocks that can wreak havoc on tires. Fortunately the roads did not present any issues for our BFGs, nor did the mud and ruts we later encountered. We took the scenic route and arrived safely in Bodie to find...motorhomes and passenger cars?! From nearby Bridgeport the "easy" road to Bodie is almost entirely paved and presents no challenge. As a result, we found the town overrun not by ghosts but by people with cameras and smartphones in hand. Even on a weekday the crowds were surprisingly large. That got us thinking about the Three Peak Mountain Snowflake Severe Snow Traction rating of the BFGoodrich All-Terrain T/A KO2s. Perhaps a snow run is in order this winter to someplace where the crowds are certain to be smaller. ⚙️



⚙️ Our first stop was the Chemung Mine, which was founded around 1909. The mine complex consisted of a mill, mine offices, a bunkhouse, and a general store. If you visit this site, please don't take any souvenirs. Leave everything as you found it so future generations can enjoy the mine.



⚙️ Our 1996 Tacoma uses a mild Skyjacker suspension to clear 31x10.50R15 KO2s. BFG recommends a rim at least 7 inches wide for this size, but we mounted them on our 6-inch-wide factory rims. BFG makes its rim recommendations for a reason. We have to run relatively low pressures for uniform tread contact from the Load Range C tires.



⚙️ We had the Chemung Mine site all to ourselves during our visit. Unlike Bodie, which is a California State Park complete with park rangers, the Chemung Mine has no fences. We enjoyed exploring the old mill and coming up with theories about what each piece of equipment was used for.

⚙️ The sidebiter lugs are the biggest visual difference with the outgoing KO tires. The new KO2 has 20 percent tougher sidewalls than the tire it replaces. This is a result of CoreGard technology that has trickled down from BFGoodrich's extensive Baja race program.





⚡ While it is not a mud-specific tire, BFG claims a 10 percent improvement in mud performance from the KO2. We were impressed by how well the tire self-cleaned when tackling this watery mud hole. Raised “mud-phobic” bars in the shoulder tread area help to release compacted mud for enhanced traction in mud and soft soil.



⚡ The new KO2 designed to last twice as long on gravel and 15 percent longer on asphalt than the previous All-Terrain. You can see the generous 3D siping, which interlock to provide more stability and resist chunking under heavy acceleration and hard cornering.



⚡ The unusual amount of precipitation last summer not only provided some mud holes to play in, but the wildflowers were flourishing too. Typically all of the flowers would be gone by August, when we visited Bodie.



⚡ Only 5 percent of Bodie remains standing, and the Standard Mine is closed to the public. Still, there are plenty of buildings to visit in the park. Rangers offer guided tours, and programs with information about each house in town are available at the visitor center.



⚡ Bodie is maintained as a state park. As such, artifacts like this grinding wheel are still in remarkably good shape. The biggest threat to Bodie is the harsh winters, which often dump several feet of snow on the town. 150 years ago ice was cut out in the winter and stored in sawdust, lasting all summer long.



⚡ This 1927 Dodge Brothers pickup was built after Bodie's heyday but when there were still fulltime residents in the town. It sits in front of two old gas pumps at the town's Shell station.

## TIRE SPECIFICATIONS

**MAKE/MODEL:** BFGoodrich All-Terrain T/A KO2  
**SIZE TESTED:** 285/70R17 (on Jeep)  
**TYPE:** All-Terrain  
**LOAD RANGE:** E  
**MAXIMUM LOAD (LB):** 3,195 at 80 psi  
**SIDEWALL CONSTRUCTION:** 3-ply  
**APPROVED RIM WIDTH (IN):** 7.5-9  
**TREAD DEPTH (IN):** <sup>15</sup>/<sub>32</sub>  
**SECTION WIDTH (IN):** 11.5 on 8.5 rim  
**OVERALL DIAMETER (IN):** 32.7  
**WEIGHT (LB):** 58.1  
**SIZES AVAILABLE (IN):** Currently 50 sizes available for various rim diameters, up to 37 inches tall.

## SOURCE

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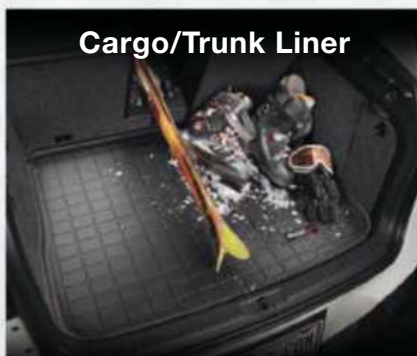
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# ULTIMATE SUMMER CAMP JEEP

## PART 6: FINISHED FOR NOW

BY Fred Williams

PHOTOGRAPHY FRED WILLIAMS

**S**UMMER CAMP IS OVER. OUR Jeep is done, and it's time for a wrapup.

But wait! Jeeps are never done. Jeeps keep getting upgrades. So don't call this a closer; it's more of a finale-for-now, with more to come down the road.

Our Ultimate Summer Camp Jeep is a built-from-scratch Jeep made of half new and half recycled parts. It's a Willys flat-fender on a Jeep JK frame, but the frame was shortened and the Willys body stretched so it is longer than usual. The pow-

ertrain is beefy with a supercharged V-8, four-speed auto, a doubler-style transfer case, and high-pinion dropout-style fabricated axles all feeding 38-inch rubber. The Jeep is fast, loud, and fun.

We built the whole shooting match in under three months at Synergy Manufacturing and buttoned it up just in time for the Ultimate Adventure. If you're new here and have no idea what the UA is, then go to [4wor-ua.com](http://4wor-ua.com) and check out all the buildup stories and action for our annual weeklong wheeling trip. And if you still want more, watch the *Dirt Every Day* episode where we build up of the Ultimate Summer Camp Jeep and the week of UA coverage; you can find the episode on the Motor Trend Channel on YouTube and on the new site [MotortrendOnDemand.com](http://MotortrendOnDemand.com). Then don't forget to apply for next year, as applications are due by the end of March 2016.

**1** Tom Wood's Custom Drive Shafts did it again. They saved our butt. Our suspension design with a track bar pushed the front diff toward the passenger side at full compression. Tom Wood's not only made us a front 1350 CV shaft with plenty of angle, but they also made it with a tube just small enough to clear our transmission at full compression—and they did it in record time.

**2** The crew at Synergy buttoned up the drivetrain in the frame after it was returned from powdercoating as we all hustled to get the Jeep done before the Ultimate Adventure. We were running down minor parts like brake lines and bolting on the Falken rubber and Trail-Ready beadlocks.







**3** We dropped the chassis and drivetrain off at Hanks Welding in San Luis Obispo, and he bent up a tight exhaust system that dumps right under the passenger seat. The exhaust was loud but also awesome-sounding when attacking big climbs during the UA. After the trip we returned to Hanks and had a longer system built to quiet it down.

**4** The driver's side of the engine bay got very crowded as the Jeep came together because we had to pack the PSC steering reservoir that feeds the hydro-boost and ram-assist steering system along with the Fox coilover shocks. The Ron Davis radiator and dual fans were also inches away from the throttle body, requiring a custom-built intake.


**5** Before any project fires for the first time there is that moment when you rattle through the mental checklist and try to cross off all the items you needed to do. We buttoned up the USCJ with all new synthetic fluids from Amsoil. Everything from ATF to coolant was double-checked before we bumped the starter over that first time and the 6.2L LSA fired to life. It was music to our ears.

**6** Our Jeep breathes through an Airaid filter that lands right above the driver's front fender. To do it again we would stretch the front hood an additional 3 inches for even more space for the intake and filter, but building a flatfender never allows much room for big engines.

**7** Our Magnum-205 shifters from Offroad Design pop through the floor just beside the

driver's plaid PRP seat, and a Winter's gated shifter finds the gears in our 4L80 from Gearstar. We were ready for a test drive.

**8** After a celebratory test drive in the back lot of Synergy, we loaded the Jeep on the trailer. We had one more stop before the UA.

**9** We headed to Tilden Motorsports/Pacific Fabrication and put the Jeep on the Dyno to get the best tune in our transmission. The transmission uses a Chevy Performance controller that allows adjusting shift points, and we wanted it just right for a week of wheeling. We also found out that the engine was putting 341 horsepower and 361 lb-ft of torque to the tires, and Tilden said there was more to be had, but we left it alone for optimal reliability. 



## SOURCES

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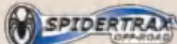
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4"	09-11 4WD w/shocks	<del>\$1599.95</del>
6"	06-08 4WD w/shocks	<del>\$1295.95</del>
4"	06-08 4WD w/shocks	<del>\$1249.95</del>
5"	94-01 4WD w/shocks <b>NEW</b>	<del>\$839.95</del>
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2.5"	94-01 Leveling Kit	<del>\$99.95</del>
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5"	10-12 4WD w/shocks	<del>\$912.81</del>
5"	03-09 4WD w/shocks	<del>\$770.95</del>
5"	94-02 4WD w/shocks <b>NEW</b>	<del>\$839.95</del>
2.5"	94-12 Leveling Kit	<del>\$99.95</del>



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LIFT	DESCRIPTION	PRICE
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	Shock Relocation Kit	<del>\$19.95</del>

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6"	2WD/4WD Lift Kit w/shocks	<del>\$1295.95</del>
2"	Lift Kit	<del>\$159.95</del>
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	Shock Relocation Kit	<del>\$30.00</del>

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2"	Lift Kit	<del>\$129.95</del>
2"	Leveling Kit	<del>\$69.95</del>
3"	Body Lift	<del>\$374.95</del>
1.5"	Body Lift	<del>\$149.95</del>

### 99-06 CHEVY 1500 4WD

6"	4WD Lift w/shocks	<del>\$1299.95</del>
3.5"	Combo Lift	<del>\$249.95</del>
2"	Lift Kit	<del>\$149.95</del>
2"	Torsion Keys	<del>\$99.95</del>
3"	Body Lift	<del>starting @ \$307.95</del>
1.5"	Body Lift	<del>starting @ \$159.95</del>

### 88-98 CHEVY 1500 4WD

6"	4WD Lift w/shocks	<del>\$1195.95</del>
2"	Lift Kit	<del>\$149.95</del>
2"	Torsion Keys	<del>\$99.95</del>
3"	Body Lift	<del>starting @ \$176.95</del>

### 73-87 CHEVY 1/2 & 3/4 TON PICKUP & 73-91 1/2 & 3/4 TON BLAZER, JIMMY, SUBURBAN

6"	4WD Lift w/shocks	<del>\$599.95</del>
4"	4WD Lift w/shocks	<del>\$499.95</del>

### 04-12 COLORADO/CANYON

2"	Leveling Kit	<del>\$99.95</del>
2"	Lift Kit	<del>\$149.95</del>

### 07-14 SUBURBAN/TAHOE/YUKON

6.5"	4WD Lift w/shocks	<del>\$1339.99</del>
4"	Combo Lift	<del>\$379.95</del>
2"	Leveling Kit	<del>\$69.95</del>
2"	Body Lift	<del>\$319.99</del>

### 92-06 SUBURBAN/TAHOE/YUKON

6.5"	00-06 4WD Lift w/shocks	<del>\$1679.95</del>
2"	92-06 Torsion Bar Keys	<del>\$99.99</del>
2"	92-98 Lift Kit	<del>\$149.99</del>
3"	00-06 Body Lift	<del>\$339.95</del>
3"	92-98 Body Lift	<del>\$199.99</del>



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# DESERT S-10

## BODACIOUS-BUILT BABY BLAZER

By Jay Kopycinski  
PHOTOGRAPHY JAY KOPYCINSKI

**C**HAD LIEN ACQUIRED A BONE-stock 1996 Chevy S-10 Blazer a few years back doing some labor bartering. It had been sitting with a blown transmission for over two years, but Chad had a plan in his head and the motivation to turn the disabled SUV into the bigger beast you see here.

He toiled on it over two hot Arizona summers, torching off the factory IFS, changing some of the drivetrain, and adding heavy-duty axles underneath. He kept the factory 4.3L Vortec V-6 engine and had the 4L60E auto transmission rebuilt with a shift kit and improved external cooling.

Tiny tires would do Chad little good for where he wanted to explore, so 39-inch rubber was tucked under heavily trimmed fenders. Linked suspensions were fabricated front and rear, then the Blazer was sprung with ADS air shocks on all four corners. Custom hydro-assist steering was added to direct the big meats.

The final result is a unique rig built to take Chad out in the Southwestern desert, whether that be rockcrawling or bombing down some fire roads. There's nothing much babylike about this Blazer anymore.

## TECH SPECS

### 1996 CHEVY S-10 BLAZER

#### >DRIVETRAIN

**ENGINE:** Stock 4.3L Vortec V-6

**TRANSMISSION:** GM 4L60E 4-speed auto, shift kit

**TRANSFER CASE:** NP241 with Box of Rocks Doubler setup

**FRONT AXLE:** Dana 60, 4.88 gears, welded spider gears, EMS Offroad hub conversion, Warn hubs, Artec axle truss, chromoly shafts, disc brakes

**REAR AXLE:** AAM 11.5 full-float, 4.88 gears, welded spider gears, Artec axle truss, disc brakes

#### >SUSPENSION

**SPRINGS & SUCH:** 2½-inch, 12-inch-travel ADS air shocks with 3-link (front); 2½-inch, 14-inch-travel ADS air shocks with 3-link (rear)

**TIRES & WHEELS:** 39x13.50R17 BFGoodrich Baja T/As on 17x8.5 Hummer H2 wheels

**STEERING:** 1991 Chevy Silverado 4WD box, crossover steering, PSC hydraulic assist ram, OEM pump

**OTHER STUFF:** Custom bumpers, body rocker armor, full skidplates, Central Pneumatic 10K winches, rear-mounted batteries, inside rear tools and tire rack, twin Maradyne electric fans

**1**

**1** Chad Lien torched most everything off the front and rear of the frame, then built up his own three-link suspensions with Panhard's. He started with some frame reinforcements and added Ballistic Fabrication brackets and tabs on which to hang suspension components. The door skins are plated with 3/16-inch steel plate to protect the rockers. Rock sliders below are welded to the body and frame.







**2** A high-clearance tube bumper sits at the rear, and the stock taillights were replaced with 6-inch oval LED lights that were inset into the stock taillight pockets. Rolling rubber is a set of 39-inch BFGoodrich Baja T/As spooned onto Hummer H2 wheels.







**3** The Blazer retains the stock, factory 4.3L Vortec V-6. The blown transmission was replaced with a Hayes-built 4L60E four-speed auto with a shift kit. To accommodate the new steering and keep the ride height relatively low, Chad sliced a hole in the hood and relocated the radiator and A/C condenser about 5 inches upward.

**4** The front axle is a Dana 60 from a 1996 Dodge 3500 spinning 4.88 gears on a welded differential. Upgraded chromoly shafts turn Warn hubs mated to an EMS Offroad hub conversion kit. A Ballistic differential cover protects the innards of the housing that has been strengthened with an Artec Industries truss. Steering assist comes from a 1½-inch-diameter, 8-inch-stroke PSC hydro ram that helps the 1991 Chevy Silverado Saginaw steering box.

**5** Lower links are built from 2x0.25-wall DOM tubing terminated with RuffStuff 1½-inch rod ends. Spring support and damping are provided by 2½-inch, 12-inch-travel ADS air shocks up front and 14-inch-travel versions in the rear.

**6** Behind the 4L60E sits an Offroad Design clocking ring used to flip a Chevy NP241 reduction unit upside-down. Behind the front crawl box is a Box for Rocks Doubler adapter from D.D. Machine used to stack the rear 32-spline Chevy NP241 T-case inline, for a total low range reduction of 7.4:1. The rear yoke



exits an SYE kit from JB Conversions. With this configuration, the T-case shifters are run straight out of the box, using no OEM linkage.

**7** Down below, Chad fabricated a custom T-case crossmember to hold the new drivetrain in place. He also fabricated a ¾-inch-thick steel belly pan to protect the engine and transmission oil pans. Behind that, the factory aluminum skidplate was trimmed to fit with the other modifications.

**8** The tail end got an AAM 11½, 14-bolt full-float axle with OEM disc brakes. Like the front, it got 4.88 gearing, welded spiders, a Ballistic cover, and an Artec truss.

**9** Chad fabricated his own bumpers. The front bumper is simple and effective and holds a Central Pneumatic 10K winch tucked up high and into the grille area. The frame sections added front and rear are constructed from 2x- and 3x0.25-wall rectangular tubing. The remaining factory frame is now fully boxed.



**10** The rear bench seat is intact so seating for five remains. Tucked in the cargo area is a steel rack supporting a spare tire. Underneath, Chad packs spare parts, fluids, tools, and a second matching winch for the rear on a removable mount. A set of Optima YellowTop batteries also resides just forward of the tailgate. 🚗



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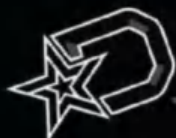


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# MAD MAXXIS OFF-ROAD RUNNER

by Fred Williams  
PHOTOGRAPHY FRED WILLIAMS

## PART 2 OF OUR POINTLESS ARMAGEDDON AUTOMOBILE

**B**UILDING A 4-WHEEL-DRIVE muscle car just because we are huge fans of the *Mad Max* movie franchise is one of the craziest projects we've ever undertaken at 4WOR, and that's coming from the guys who built the double-ended Jeep Wrangler back in 2012! This 1973 Plymouth RoadRunner is going to be nuts. The car (in stock form) has no real frame but is akin to a Jeep Cherokee with a unibody design, and we are planning on stuffing a big heavy V-8 engine in this beast, so

plenty of structural upgrades are needed. Plus, it's pretty rusty. Not East Coast rusty where the roads are salted in winter, but still pretty bad in the eyes of most Californians. That's probably why we could buy it so cheap after it had been on Craigslist for weeks.

So we started with a rusty old pile of Mopar and drug it to Chappelle's Exhaust and Kustoms in El Cajon, California, where we began the destruction before the construction. The goal was simple: Build

something cool and fill it with tires from Maxxis. Maxxis had a new mud tire coming out and was willing (or crazy enough) to sign up as a partner on this build. It couldn't be a better fit. We need big tires, and calling the project the Mad Maxxis Off-RoadRunner just makes sense.

This month we'll dive into more of the build, but you can see all the action on *Dirt Every Day* presented by 4Wheel Parts on the Motor Trend Channel on YouTube and on the new MotorTrendOnDemand.com website.





1



4



2



3

**1** The 1973 RoadRunner wasn't perfect when we drug it to Chappelle's Exhaust and Kustoms, but we had a solid plan to make it awesome. The rusty trunk lid was just the tip of the iceberg when it comes to the "patina" that had eaten away the body of this fine automobile.

**2** We gutted the trunk, trunk lid, rear window, and dividing material and began tubing out the rear end. A 50-gallon diesel tank was sourced from a junkyard tow truck to feed the Cummins V-8 that will live under the hood.

**3** We can't say that our roll bar is conventional at all, but we feel it is strong by design, even if that design is wacky. The fuel tank sits right behind us and bolts to a recycled propane tank that was bolted to the floor and cut open to make a dog house in case our hounds want to ride along. We doubt they'll want any part of this insane machine.

**4** Behind the fuel tank we will stuff two spare Maxxis tires. Not because we think we'll have failures, but rather because we are running different size tires: 35s up front and 40s in the rear. This will require different gear ratios in the axles: 4.56 up front and 5.38 in the back.

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## MAD MAXXIS RUNNER

**5** The RoadRunner is a unibody vehicle, and we knew it wouldn't be enough for our drivetrain. We hit up the local Industrial Metal Supply and came home with a few sticks of 3x0.188-wall tube to build a solid subframe for mounting our suspension. The frame is welded straight to the bodywork, so it is still unibody, but now with thick steel instead of sheetmetal to build off of.

**6** Our rear Deaver springs were left over from the 2011 Ford F-150 we built for an Ultimate Adventure a few years back. That truck was returned to Ford and sadly crushed, but not before we scavenged some goodies to recycle into the Off-RoadRunner.

**7** A 3-inch boxed tube rear crossmember supports the rear of the leaf springs and ties through the floor to the rollcage in the bed. We had just five weeks to build the car, so the fabrication and suspension had to be dirt-simple, strong, and easy to assemble.

**8** The rear axle is also simple and strong. It's the Dynatrac ProRock 80 stuffed with an ARB Air Locker and 5.38 gears that was previously under the UA F-150. We also added a set of 14-inch Fox shocks with compression damping adjusters that mount to the bed cage through cutouts in the rear wheelwells.



“We had just five weeks to build the car”





7



8

## SOURCES

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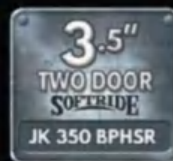
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# REASONS TO CROSS THE 'CON

## WOMEN (AND MEN) LOVE WHEELING WITH JEEP JAMBOREE USA

by Brit Hill

PHOTOGRAPHY ASHLEY AND BRIT HILL

**R**UBICON, THAT FUNNY WORD, has many definitions. It's the trail where Jeeping and rockcrawling originated. It's the namesake of the most capable out-of-the-box Jeep to date. And it's a very special place for off-road enthusiasts of all brands. Wife of Jeep Jamboree USA founder Mark A. Smith muses, "Mark found Shangri-La [when he discovered the Rubicon]. We were honeymooning in Georgetown, California, but we had jobs in Las Vegas. We had to call them and tell them we weren't coming back."

A trip over the Rubicon isn't just a drive down a dirt road; it's people, a place, and a thing. It's a day of 4-wheeling ending with everyone leaning a little closer to the campfire and laughing together about that new dent, that awesome maneuver over a tricky obstacle, or that power steering hose busting loose when your gal took the wheel.

You don't have to be off-road legends like the Smiths to cross the Rubicon. To have a legendary experience, just sign up with Jeep Jamboree USA for the five-star Rubicon adventure. This trail is a great place to drive by yourself (but that's no fun), with your family, or with your girl (or guy). Ride along as your special someone drives, or even have Dad as a spotter. We've seen it all. This past August we went with some Jeepin' friends. We want to share the top reasons to cross the 'Con with Jeep Jamboree USA and convince you to do the same.





# CROSS





**1** Irene Smith has been the Mother Superior of the Rubicon Trail since 1953. "When the trail would get rough, Mark would get out and help people, and I would drive," she says. "[People] would say, 'Oh my God, it's a woman driving!' I was trained on a regular Jeep without power steering. They'd put the windshield down, and I'd be like Grandma Moses leading the way. This year we had 39 kids on the trip. It really brings families together."

**2** Still wary as to whether you and your Jeep are Rubicon ready? Almost any Jeep model can pass the test (although the ones with the Rubicon parts inside are definitely capable). This year on the trip were six CJs, three YJs, 12 TJs, 11 TJ Rubicons, 13 two-door JKs, 23 four-door JKs, one Cherokee, and 43 modified vehicles. Two hundred and fifty-four adults and 39 kids participated in the 18th annual Jeep Jamboree Rubicon trail ride.

**3** Thuy (pronounced *Twee*) Davis took her 2015 Rubicon and fiancé Jim Ireland along for the ride. Her rig is outfitted with a Rubicon Express 2½-inch lift, Bilstein monotube shocks, Fuel Maverick wheels, 33-inch tires, Smittybilt rock sliders, a Fox Racing steering stabilizer, Poison Spyder differential covers, and Rock Hard skidplates.

**4** Cody Willis and his father, Bob, are no strangers to the off-road world. Bob works for Rancho Suspension and has had Cody behind the wheel for years. Cody's take on the toughness of the trail? "The Rubicon is in the middle of the road, great for beginners to intermediate Jeeps," he says. "We drove through without any damage." Although, in our experience, even advanced drivers will have plenty of fun on the Rubicon.

**5** From the moment your group makes it to Rubicon Springs, it's time to relax. You can bring any supplies you'd like, but the team provides everything not mechanically related, including seven meals. Pearse Umlauf, vice president of MASOR/Jeep Jamboree USA, says, "We even fly in beer via helicopter just in case you forgot yours at home."

**6** The adventure begins in Georgetown, California, at Jeep Jamboree USA headquarters with a 45-minute on-road drive through the Sierras en route to Loon Lake Dam and the 4x4 trailhead. The recreational portion is about 22 miles, in which participants travel from Loon Lake to Rubicon Springs on Friday then from the springs to South Lake Tahoe on Sunday.

**7** Glenda Gau, advisor for Jeep Jamboree USA, says what makes the jamboree so special is that it is a family-oriented weekend. Irene Smith adds, "For the children, they attend a Rubicon trip with their parents, and then they are inspired to buy a Jeep and become our trail guides." Saturday evening, after swimming, hiking, and a steak and potato dinner, the event staff builds a large fire for everyone to enjoy. For most of the kids the memory of that fire never fades.







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## TRAIL TIPS FOR ROOKIES, NEWBIES & FIRST-TIMERS

**T**hinking of crossing the Rubicon Trail for the first time? Maybe it's your first time driving off-road ever? Or maybe your significant other needs convincing to go on this iconic trail ride with you? Here's some advice from those that have successfully conquered the 'Con.

**WHAT WILL WE EAT?** Mark was a cowboy, and he liked to cook. Now the food is so sophisticated. We try to fly in the best! [Awesome steaks! —Ed.] Mark's favorite lunch was chicken fingers and brownies. The brownies have become so popular that people can order them year-round. —Irene Smith

**ARE THE OBSTACLES REALLY HARD, AND WILL THEY DAMAGE MY JEEP?** The obstacles can be exciting, but if you're properly armored (skidplates and rock sliders)

and follow the trail guides' instructions, you will have little or no damage. The trail left a minor "kiss" in the front [of a] stock bumper. At a fellow Jeepers' suggestion, I took a silver Sharpie and wrote, 'I kissed a rock on the Rubicon Trail' on the bumper. Badge of honor. —Thuy Davis

**IS IT SCARY TO CAMP IN THE WOODS?** We both had prepared to be camping in the woods. Little did we know Rubicon Springs is like a hidden oasis within the Sierra Nevada, complete with kitchen, stage, bar, and bathrooms! —Bob and Cody Willis

**ARE THERE BEARS?** Maybe, but we never see them. We think they're afraid of Big Tom, a retired special operations commando who runs Rubicon Springs Base Camp. —Pearse Umlauf



**WHY CONQUER THE RUBICON WITH JEEP JAMBOREE USA?** The piano was Mark's idea. It is a special thing that we do, and it has become our tradition to fly a piano into Rubicon Springs for guests to enjoy live music. —Irene Smith



# "THAT'LL HOLD A CUP-A-JOE. OR A GALLON OF YEEHAW!"

**8** One thing that makes the Rubicon Jamboree a cut above the rest is that it is the only one of their 30 nationwide events where you "rough it" for three nights. What if it rains, you ask? Thuy Davis says, "Our group came prepared with tarps, which we tied to the trees and over our tents. If it rains we'll be cozy sitting under the tarps enjoying wine with friends."

**9** Jeep Jamboree rates the trail difficulty at 10, and 4-Lo is a must. Although with over 50 guides and spotters, the trail is maintained and there are bypasses for well-known and challenging obstacles, such as Little Sluice. Thirty-eight percent of patrons of a Jamboree are first-timers, but like Davis, many are repeat offenders—um, attenders. No one is left behind.

**10** Nena Barlow, seen here, is one girl who doesn't need a man to lead the way. Owner of Barlow's Adventures, she guides tours throughout the southwest. She is also a certified drive coach by the International 4WD Trainers' Association. If you're not one for setting up camp, Jeep Jamboree USA and Barlow's Adventures have collaborated to provide an optional Platinum Experience in which one helicopters in from Squaw Creek in Lake Tahoe and jumps in a borrowed vehicle, which they can wheel to an awaiting cot by the river.

**11** Bob Willis, sitting copilot, brought this 2012 Jeep Wrangler Rubicon with upgraded armor and power, Rancho RockGear, rock sliders, front and rear bumpers, tube doors, and an Edelbrock supercharger. In addition, the Rubicon was outfitted with a Rancho Progressive Sport lift kit, Rancho RS5000X shocks, and 37-inch BFGoodrich mud-terrain tires on Raceline beadlock wheels. And if all else fails the front has a Warn winch. Bob's son Cody, who drove, made driving the JK look effortless.

**12** Mary Bacon was on her way to another Jamboree when her previous Jeep decided its days on the trail were numbered. She immediately traded her old Jeep for this 2015 Rubicon and christened it on her first trip across the Rubicon Trail. She calls Cadillac Hill (a series of hairpin turns leading to Lake Tahoe from Rubicon Springs driven on the final day) the most challenging aspect of the weekend.

**13** The Rubicon Trail trip begins early in the morning in Georgetown, California, with breakfast burritos, coffee, and fruit, among other hearty options—plus a brown bag lunch. Attendees are divided into Red, Blue, and White groups and dispersed in increments to keep the trail moving.

**14** Traveling through the El Dorado National Forest in a large group such as this has its advantages. Red Group, the first to depart, begins snaking through the entrance to the forest around 7 a.m. and makes it to Spider Lake by midmorning. Lunch is a "stop when you want to" thing. There are plenty of opportunities to jump out and enjoy the view. ☺

## SOURCE

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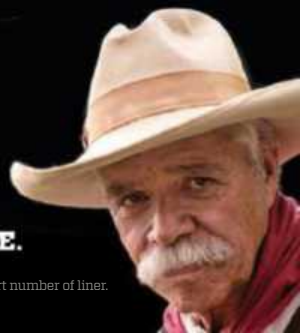
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# ROSCOP DRIVETRAIN

BY Verne Simons  
PHOTOGRAPHY VERNE SIMONS

**R**OSCO P. DRIVETRAIN, OUR solid-axle-swapped former police cruiser 2005 Chevy Tahoe on tons, is now our daily driver, so downtime is no good. We've racked up a few thousand miles on the truck while continuing to tackle projects that we can handle over a long weekend (rather than having the truck apart for months at a time). Driving the truck during the week allows us to enjoy it and figure out what works and what we need to change or improve.

The Tahoe has new front and rear 1-ton axles, but the gears are not matching because the front came from a Dodge (or is it a Ram?) and the rear from a Chevy. That's no good. It keeps us off the trail and out of 4-wheel drive. No 4-wheel drive makes Verne a sad boy, so regearing the 9 1/4 AAM front axle and GM 14-bolt rear was at the top of our list.

We have ordered up a pair of 4.56:1 ring-and-pinion from Yukon Gear & Axle along with master install kits that contain Timken bearings. Since we've done lots of the work on the truck ourselves, we decided to continue the theme. Thus it is time for a good ol' driveway axle regear. While we had the axles apart, there was no better time to add locking differentials to both axles.

The Tahoe has 37-inch Mickey Thompsons and a modified steering box from West Texas Off Road, but we never finished installing the hydraulic ram assist, and steering with the big rubber isn't easy, so we took a weekend to cross that off the list as well. The To Do list is getting shorter and we are a bit closer to calling the project done. Of course we still need a winch, a front bumper, rock sliders, and a few more tools that will make the truck reliable and more usable on- and off-road. Somehow our list just got longer.

**1** One thing that makes the 14-bolt easier to work with is the removable pinion housing. Once we installed the Crush Sleeve Eliminator Kit from Yukon Gear & Axle (PN SK CSGM14T, \$60) we were able to adjust pinion bearing preload in the vise instead of on our backs under the Tahoe. To change the pinion bearing preload, you add or remove shims that come with the Yukon kit until the specified bearing preload is reached. This involves disassembling the pinion housing a few times, but the process is quick once you're close. The next part of getting a proper gear mesh pattern is setting pinion depth. On a full-float 14-bolt, this is set with shims that go between the pinion housing and the axlehousing.

**2** Regearing axles at home is something everyone should attempt, but if your work is not perfect it won't last and will end up costing you more than going to a professional in the first place. The process is slow and requires special tools to make very small adjustments so everything will work together. But if you are going start regearing axles, the GM full-float 14-bolt is a good one to start with. It has a removable pinion housing that is easily shimmed to set the pinion depth and threaded adjusters for setting the carriers position side-to-side, although everything about the 14-bolt is huge and heavy.

**3** Our junkyard fresh rear axle had a factory locker in it known as a Gov-Lok (right). This locker leaves something to be desired because it acts like an open differential until the rear tires reach a certain rpm when it locks—sometimes with a bang. With larger tires and more gearing this bang can damage the differential. For this reason we decided to go with a Grizzly Locker from Yukon Gear & Axle. This type of locker requires an open differential (left) that the Grizzly is installed in, so we sourced a used one from one of our friends. The Gov-Lok has three cross-shafts (and bosses) as opposed to four on the open carrier. you can see clutches and clips in the windows in the windows in the case of the Gov-Lok while the open carrier has side gears in these windows (or a locker if one like the Grizzly is installed).

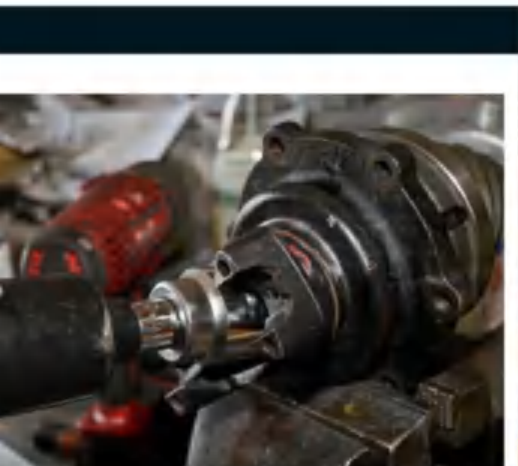
**4** With the ring gear removed the 14-bolt open carrier will split into two halves. The Grizzly Locker (left) drops into the open carrier, replacing the side gears, cross-shafts, and washers shown on the right. The Grizzly is an automatic locker that uses a tried and true design to turn both axleshafts despite rpm, allowing one axle-shaft to turn faster when you go around a turn.



## PART 6: GEARING, LOCKERS & STEERING









**5** You may have heard of shaving a 14-bolt for ground clearance. This makes sense for off-roaders but involves machining hardened parts and welding on the axlehousing. We like the idea, but we're doing the quick and dirty version. While the axle was disassembled we took a Sawzall to the housing and trimmed off about 7/8 inch from the bottom lip. Start the cut just below the bottommost diff cover bolt hole and cut slowly. Our axle has a drain plug that we removed prior to cutting. Once the cut was done we reinstalled the plug with some thread sealer and ground the plug flush.

**6** We trimmed the bottom of the factory diff cover (although we'd like to upgrade to thicker diff covers front and rear soon) and ground a new lower bolt to match the cut. With this trim we have an inch better clearance than a stock 14-bolt. We regeared the truck to 4.56:1, but after driving the truck we realized that 4.88:1 or 5.13:1 would have been a better choice for pulling those highway hills.

**7** Our AAM front axle from a 2012 Ram is similar to the GM 14-bolt rear axle because they both have spanners that adjust the carrier side-to-side. This makes adjusting the backlash much easier than on a Dana-style axle, which uses shims to move the carrier side-to-side. However, the AAM does not have a removable pinion housing, nor does this axle have a crush sleeve eliminator kit available (yet), making setting up gears more difficult. One tool that is a must in order to adjust gears with shims with-

out damaging the bearings or removing the pinion bearings is a quality bearing puller. We've had the Yukon Gear & Axle bearing puller (PN YT P20, \$400) for years, and though we don't use it a lot, it is priceless when we need it.

**8** If you've regeared axles or read about it, chances are you've heard of setup bearings. These are bearings that have been machined to go on the pinion or carrier without a press fit, so they are easy to remove. This makes adjusting the pinion shim thickness and/or carrier shim location easier. We used a brake cylinder hone to turn our old pinion bearings for the 9 1/4 into setup bearings, but Yukon sells them for many axles. The gear install kit comes with a new pinion nut, but the pion nut is a locking nut that can damage the pinion gear threads if installed and removed multiple times. We turned the old pinion nuts into a "pinion setup nut" by shaving the shouldered area off with a grinder so it could be installed multiple times without fear of thread damage. On final assembly we used the brand-new pinion nut (included in the Yukon master install kit) with a little red thread-lock.

**9** This is the electronic locker from AAM that is found in the front axle of newer Power Wagons. It uses an electromagnet to push pins into one of the side gears, locking it in place at the flip of a switch. The electromagnet is simple and similar to the clutch found on your truck's A/C compressor which cycles on and off hundreds (if not thousands) of times during



a hot summer day (so it's simple and reliable). The actuator has four wires, but we only use the black and white wires in the Tahoe. The other two are for sensors communicating with the Power Wagon's computer for safety reasons.

**10** The black and white wires of the AAM locker in our 9 1/4 axle should be routed to avoid the ring-gear bolts to the Yukon ring-and-pinion. The outer portion of the electromagnetic actuator remains stationary, resting against the bearing cap, while the inner part spins with the axle.

**11** We routed the wires through a small rubber grommet that passes through the factory diff cover. With ample application of silicone to the grommet and wires we should be able to seal the diff from water intrusion and prevent gear oil leaks. We routed the wires up along the axle breather tube to the Tahoe's underhood fuse block and will rig up a switch and a relay (to be sure the locker is getting 12 volts).

**12** Yukon offers a Spin Free Kit (PN YA WU-13, \$1,830) for almost all Dodge/Ram 2500 and 3500 4x4s built between 1999 and 2015 as well as several Jeeps and some solid-axle 1/2-ton

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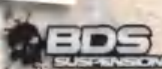
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Dodges trucks. This kit eliminates the factory unit-bearings in favor of traditional (and rebuildable) Timken wheel bearings and hubs. The kit also includes Yukon Hard Core locking hubs and brand-new 4340 chromoly stub shafts, and retains the wheel speed sensors to keep computers happy. The selectable locking hubs will help eliminate any unwanted vibrations from the front driveshaft in our custom-built Tahoe and can help with fuel economy because the front axle isn't spinning when on the street.

**13** Just to show off a little, here is the Yukon chromoly stub for our 2012 AAM axle along with a factory 30-spline Dana 60 stub. Of course you can also upgrade a Dana 60 to 35-spline, but the larger spread of the ears and larger U-joint of the later AAM axles like this one equates to strength that makes this axle a viable swap candidate. The AAM axle uses a Spicer 1555 steering U-joint, which is visibly larger than a Spicer 5-806x or SPL55-3X U-joint in a Dana 60. That's something to brag about. But the AAM is only 33-spline, whereas a Dana 60 uses a 35-spline inner axleshaft and puny 30-spline stub shafts.

**14** Yukon's Spin Free Kit installs much like hubs and bearings on an older (GM or Ford) Dana 60 front axle. With our axle (unlike some of the earlier Dodge front axles), the brake rotor goes over the hub from the outside rather than being held to the back of the hub via the wheel studs. This was not clear in the

instructions but became obvious with a little preassembly. We used our Harbor Freight Tools press and a length of tubing to install the supplied wheel studs to the nice shiny Yukon hubs.

**15** Finally we will get to enjoy the added strength of our Redneck Ram hydraulic steering ram underneath Rosco. We cut down two of the supplied tabs and welded them in place on our AAM front axle where the front steering stabilizer mount used to reside. You could use the factory stabilizer mount for the ram, but the factory part is made out of thinner material than the tabs supplied by Redneck Ram and also would cause the ram to hang down lower than we would like. We used shim stock between the tabs and rod end because the gap will shrink when fully welded.

**16** The other end of the ram is welded in place on our AAM's factory tie rod. To establish where to weld these tabs in place, we followed the guidance of our pal Chris Durham of Chris Durham Motorsports. Start by fully extending the ram and turning the wheels the same direction all the way to the steering stops (usually all the way to the driver side). Then use this to establish where to weld the tabs from the ram on to the tie rod. Tack-weld them in place. Next, with the engine off, turn all the way to the other direction. The steering stops on the knuckles should bottom before the shaft of the ram fully enters the body of the ram. Measure the exposed amount of shaft

on the ram, cut a sleeve that just passes over the ram's shaft to the same length, and install. This will allow you to steer both directions without stressing the knuckles, ball joints, steering box, and so on. When the ram reaches the sleeve it will stop against the sleeve rather than overextending steering components.

**17** To get the best performance out of Rosco's steering system, we then hot-rod'd the power steering pump with advice from our friend Trent McGee. We removed the high-pressure line from the back of the power steering pump and pulled the valve that this line threads into. We then drilled out the orifice that runs through the center of the valve from  $\frac{3}{64}$  inch to  $\frac{5}{32}$  inch and reinstalled. This allows a little more fluid to flow from the pump and thus quickens the steering of the Redneck Ram. This improves the response times of the steering and overall feel of the system. It was a quick, easy, and free upgrade. ☺

## SOURCES

**AAM**  
866.865.6312  
demandaam.com

**REDNECK RAM**  
87.STEERING  
westtexasoffroad.homestead.com

**YUKON GEAR & AXLE**  
888.905.5044  
yukongear.com





# CAN YOU INSTALL YOUR OWN GEARS AT HOME?

By Harry Wagner

PHOTOGRAPHY HARRY WAGNER AND COURTESY OF THE MANUFACTURERS

**I** NSTALLING NEW GEARS AND differentials is one of those jobs that even skilled mechanics and fabricators typically don't like to tackle at home for many reasons. Setting up gears requires specialized tools and has a low margin for error, and if you get it wrong you will likely be stuck on the side of the road and have to purchase new parts and start all over.

Not all differentials are created equal though. Adding a spool to a Ford 9-inch differential is significantly easier than installing a selectable locker in a Dana 44. Why is that? For starters, the 9-inch uses a removable third member that allows you to work on a bench without removing the entire axle. It also uses screw adjusters instead of shims to position the carrier, and the removable pinion support makes it much easier to set the pinion depth. If you know what you are getting in to, the odds of success are much higher.

# DIY GEAR INSTALL

## TOP 10 DIFF INSTALL TIPS

- Remove the axle from the vehicle (if possible).
- Keep track of all the parts that come out of the diff during disassembly and where they go inside the axle. Zip ties are a great way to bundle shims.
- Have a clean work area, and clean all parts thoroughly.
- Buy quality parts. They are manufactured to tighter tolerances and ease setup.
- Have all the parts you need on hand before you begin.
- Take your time and be patient, taking photos and making notes along the way.
- Start by setting the pinion depth, then the backlash. Next set the carrier bearing preload and finally the pinion bearing preload, in that order. If you have an axle with a fixed pinion support, the pinion bearing preload is set after the pinion depth.
- Move the pinion closer to the ring gear to set the pattern deeper or farther to set the pattern shallower.
- Move the ring gear closer to the pinion to decrease backlash or farther to increase backlash.
- Properly break in gears and change the gear oil after installation.



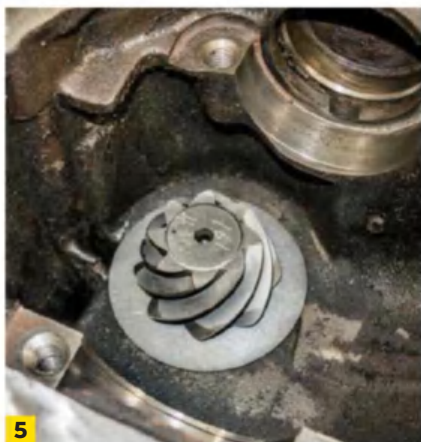
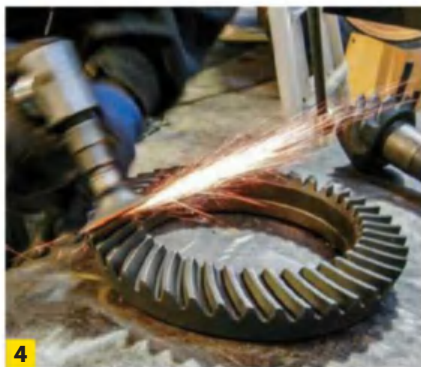
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**1** Mark the location and orientation of the main caps during disassembly. The caps are machined for a precise fit so you need to reinstall them in the same position.

**2** Note the shim thickness on each side of the carrier you are removing and also on the pinion bearing. These shims provide a useful starting point when setting up the new ring-and-pinion.





**3** During assembly, coat all bearings and seal surfaces with gear oil. Never use bearing grease on pinion or carrier bearings as it will negatively influence assembly readings. Coating seals with white lithium grease will help hold the spring in place and make them easier to install without damaging the seals.

**4** “Dressing” the ring-and-pinion involves running a fiber sanding disk mounted on a



## DIFFERENTIAL INSTALLATION (EASIER TO HARDER)

**DROP-IN LOCKER OR MINI SPOOL.** No bearings or shims need to be replaced when installing these traction devices, making them perfect for the novice installer. Sometimes you don’t even need to remove the carrier to install a locker that replaces the spider gears (often referred to as a lunchbox locker) or mini spool if the ring gear is thin enough.

**FULL REPLACEMENT LOCKER OR SPOOL.** If you are installing a new full case differential such as a Yukon Grizzly Locker without changing gear ratios, the pinion gear does not need to be removed. This eases installation; typically the shims from the previous case can be reused with new bearings for an easy setup.

**SELECTABLE LOCKER.** Adding a selectable locker such as a Yukon Zip Locker complicates the installation for a few reasons, but the ability to turn the locker on and off can make the complexity worthwhile. In addition to the need to drill a hole in the housing and route an air line, the Zip Locker uses a thin bearing opposite the ring gear and a seal housing with an air line. This requires added care during setup.

die grinder over each tooth. This small detail will make it easier to set a pattern and allow the gears to run quieter upon break in, but you must thoroughly clean the gears following this step.

**5** Assemble the pinion with its original shims yet without a crush sleeve to establish an approximate pinion depth. Removing shims increases pinion bearing preload, while adding shims decreases preload.

**6** Pinion preload doesn’t exist until the bearings contact the races, but the preload increases rapidly once the bearings meet their races. Tighten the nut in small increments until the preload reaches the ideal setting. Tightening the pinion nut beyond the ideal preload threshold effectively destroys the crush sleeve.

An alternative is to use a solid spacer with shims to set the preload.

**7** Yukon Gear & Axle marks the recommended pinion depth on the top of the gear. Between this and measuring the shims you remove from the old pinion, setting the pinion depth will hopefully only take a few attempts.

**8** When changing the pinion depth, make large changes until the pattern is close to ideal. By “large change” we mean 0.005 to 0.015 inch. Intentionally make adjustments that move the pinion too far at first. If the pinion moves too far and the pattern changes from one extreme to the other, the correct pattern lies somewhere between the two and you can then hone in on it.





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**9** Heating the ring gear will cause it to slightly expand, making it easier to slip over the carrier. Don't heat the gear over 200 degrees though or you risk harming the hardening. Never pull a ring gear down onto a carrier by using an air gun on the ring gear bolts. Doing so can cause the ring gear to become cocked and you will never be able to get a good pattern.

**10** Always use new ring gear bolts, since they can stretch once they are torqued, and use thread-locking compound to keep them from backing out. Locking compound on the pinion nut helps retain the nut position and pinion bearing preload, and an anaerobic gasket maker on the pinion washer will keep it from leaking. A lubricated washer reduces friction and prevents the nut and washer from galling during tightening procedures.

**11** Yukon Gear & Axle offers setup bearings that allow you to change shims without the need to press the bearings on and off the carrier and eliminate the risk of damaging your new bearings. You can also make your own setup bearings by slightly increasing the ID of old carrier bearings, as shown here.

**12** Removing bearings without damaging them is nearly impossible without a tool like Yukon's bearing puller. This puller fits many sizes of bearings and allows both bearings and delicate shims to be reused during setup or if you want to transfer bearings from your existing differential to a new differential.

**13** If the preload is close and the backlash is loose, add shims to the left side. This increases the carrier bearing preload and tightens the backlash at the same time. If the preload is close and the backlash is too tight, add shims to the right side. This increases both the carrier bearing preload and the backlash at the same time.

**14** Oftentimes you can use a pair of pry bars to remove a differential and a dead blow hammer to install the new differential into the housing. One notable exception is when using a differential like the Yukon Zip Locker, which has a seal housing and air line on the outside of the carrier bearing and shims. In order to avoid damage to these sensitive components, a case spreader, such as the one available from Yukon Gear & Axle, must be used.

**“If you know what you are getting in to, the odds of success are much higher”**

## ALL AXLES ARE NOT CREATED EQUAL

**FORD 9-INCH.** One of the reasons the 9-inch is so popular is how easy it is to set up. The third member can be easily removed from the vehicle, allowing it to be assembled on a bench rather than under a vehicle. Plus it uses a removable pinion support that makes it easy to set the pinion depth, and the 9-inch uses screw adjusters instead of shims on the carrier bearings.

**CORPORATE 14-BOLT.** The 14-bolt is like a bigger version of the Ford 9-inch, with screw adjusters and a removable pinion support. The only downside to the Corporate 14 bolt is that the differential is cast into the housing, so the entire axle must be removed or you must do gear work under your vehicle.

**SUZUKI/TOYOTA.** Like the Ford 9-inch, Suzuki and Toyota 4x4s use removable third members. They also use screw adjusters for the carrier bearings; however, they do not have a removable pinion support.

**AAM.** American Axle & Machine differentials also use screw adjusters, although they do not have removable third members. Some AAM axles, such as the 10.5-inch differential that is the descendant of the 14-bolt, also have removable pinion supports.

**FORD/STERLING.** Ford axles, such as the 8.8 and 10.5, do not use removable third members, bearing adjusters, or removable pinion supports. They do, however, use shims outside the carrier bearings, so there is no need for setup bearings. Newer Dana axles have outboard shims.

**DANA.** While Danas are the most common axles you will find under most Jeeps and older fullsize trucks, they are also the most challenging to work on. They do not have removable third members or pinion supports, and they typically use shims between the carrier and bearings. There are some exceptions, such as some new Dana 44s that use outboard shims and the “Super 70” that use screw adjusters, but these are less common.



“A contact pattern centered from face to flank indicates the correct pinion depth”



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**15** Three different shim or adjustment methods are used on different differentials. Screw adjusters are the easiest to install since they do not require shims. Shims outside of the bearings are the next easiest to install, following by shims inside the bearings, which unfortunately is the most common method of locating the carrier and ring gear.

**16** Backlash refers to the amount the ring gear can rotate forward and backward when the pinion gear cannot move. To measure backlash, prevent the pinion gear from rotating and rotate the ring gear back and forth. The amount the ring gear can move determines the amount of backlash.

**17** We can determine how gears mesh by changing how close the pinion gear is to the ring gear centerline. The pattern's position to the tooth's ridge and valley is an indication of the pinion depth. Disregard the pattern's position to the tooth's heel and toe.

**18** A contact pattern centered from face to flank indicates the correct pinion depth. A pattern closer to the gear face means the pinion is too far away from the ring gear. To improve the pattern, move the pinion closer to the ring gear centerline. A contact pattern closer to the gear flank means the pinion is too close to the ring gear, so the pinion should be moved away from the ring gear centerline. ⚙️

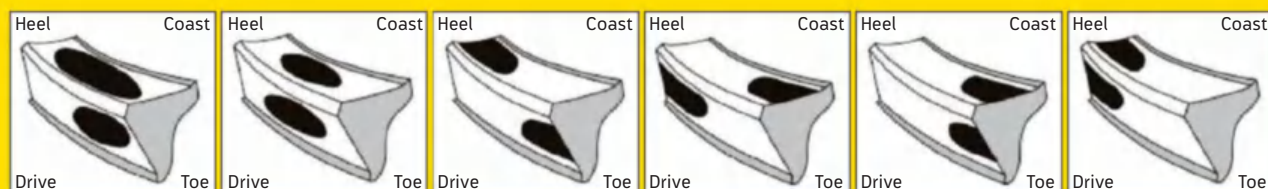
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866.631.0196  
ringpinion.com

**YUKON GEAR & AXLE**  
888.905.5044  
yukongear.com

## ACCEPTABLE PATTERNS

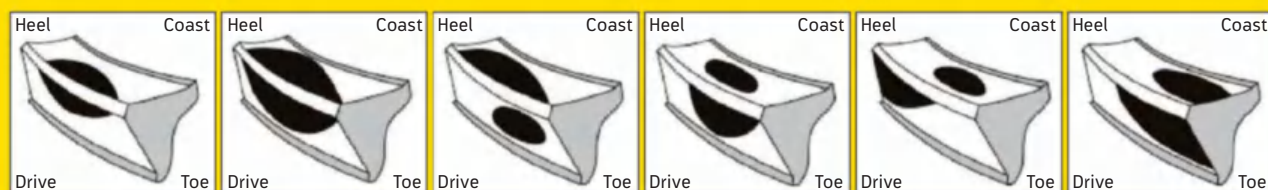
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## PINION IS TOO CLOSE



## PINION IS TOO FAR AWAY



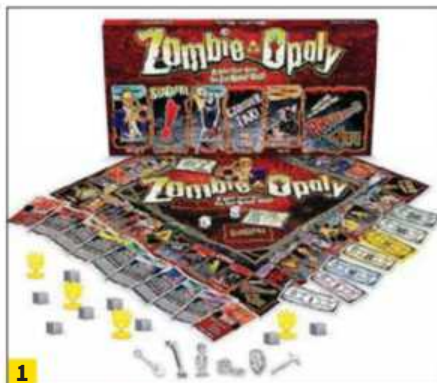


# HO, HO, HO, FOR 4-LO HOLIDAY GIFT BUYER'S GUIDE

by **Harry Wagner**

PHOTOGRAPHY COURTESY  
OF THE MANUFACTURERS

**N**O MATTER WHAT YOU celebrate, be it Hanukah, Christmas, Kwanza, Ramadan, or just the fourth Friday in December, the one thing we all have in common is a love for shifting our transfer cases in 4-Lo. While we would all love a new 4x4 or a super-charged V-8 engine, unless you're Donald Trump's nephew that probably isn't going to happen. So we have gathered up some of our favorite parts and accessories that can make your next adventure more fun without breaking the bank.



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## 1 GENUINE HOTROD HARDWARE ZOMBIE-OPOLY GAME

What better game to play when you're camping in the middle of nowhere than Genuine Hotrod Hardware's Zombie-Opoly? Choose your token, roll your bones, and shuffle around the board purchasing favorite zombies like Officer Stump, Cheerless, and Goodbye Kitty. Play the traditional version or step up the pace and play the one-hour version—perfect for the modern, fast-moving undead. Ages 8 and up. **INFORMATION:** Genuine Hotrod Hardware, 800.575.1932, [genuinehotrod.com](http://genuinehotrod.com).

## 2 AXIAL SCX10 DEADBOLT

The SCX10 platform is the proven chassis of choice for scale enthusiasts around the globe. Now Axial has taken the popular Deadbolt body from the AX10 chassis and placed it on the SCX10, which gives it a cool scale appearance and a new factory body choice. The Deadbolt comes ready to run with a realistic driver figure, officially licensed Maxxis Trepador tires, and officially licensed Walker Evans Racing wheels. **INFORMATION:** Axial, 877.642.9425, [axialracing.com](http://axialracing.com).



## 3 TUFFY JK CUBBY STORAGE SECURITY COVER

The engineers at Jeep finally built some unique, out-of-the-way storage for the back of the Jeep Wrangler—trouble is there's no way to securely lock up what you've put in there. Tuffy Security Products solved this dilemma with the new JK Cubby Storage Security Cover. This unique lockable cover bolts to the tub, replacing the original flimsy cover with a powdercoated 16-gauge and 11-gauge steel assembly. The weight-bearing steel assembly also provides a sturdier surface to place heavier items on top of. **INFORMATION:** Tuffy Security Products, 800.348.8339, [tuffyproducts.com](http://tuffyproducts.com).





#### 4 SMITTYBILT MULTITOOL

The new Smittybilt Multi-Function Pliers are a great addition to your toolbox or glovebox. Smittybilt's Adaptable Compact Tool is a 10-in-1, spring-loaded tool that has everything you need. From screwdrivers to pliers to a knife or a ruler, this tool has everything in a compact package for off-roading and camping. **INFORMATION:** Smittybilt, 888.717.5797, smittybilt.com.

#### 5 MASTERCRAFT SAFETY POCKET ROLLUP

Constructed from rugged 100 percent cotton duck canvas, these MasterCraft Safety organizers fit open-end/box wrenches and close with a hook-and-loop strap. Available in two sizes and in either black or red, they are an excellent way to keep your tools clean, organized, and rattle-free on the trail. **INFORMATION:** MasterCraft Safety, 800.565.4042, mastercraftsafety.com.



#### 6 DAYSTAR JACK HANDLE ISOLATOR

Why didn't somebody think of this years ago? This is a must-have for any Hi-Lift owner. Daystar's 1-inch-thick polyurethane blocks simply slip over the jack handle and the jack's I-beam to keep them parallel and secured together. No more out-of-control handles and that constant clanging on the trail. Fits all Hi-Lift brand jacks. **INFORMATION:** Daystar, 800.595.7659, daystarweb.com.

#### 7 GORILLA CLEAR REPAIR

The toughest, clearest repair tape on the market, Gorilla's Clear Repair is the ideal solution for almost any repair, from a cracked smartphone screen to broken headlights or torn plastic, such as soft-top windows. With an extra-thick adhesive layer and tough, ultraclear backing, Gorilla Clear Repair is a translucent, durable bond to repair almost any surface. **INFORMATION:** Gorilla Tape, 800.966.3458, gorillatough.com.

#### 8 HUSKY WEATHERBEATER FLOOR LINERS

Put nature firmly in its place. The rugged and sporty WeatherBeater Floor Liners perfectly conform to the contours of your ride and offer unbeatable carpet protection for whatever nature hurls at you. The design process perfectly forms

each liner to the contours of your vehicle. Stay-Put cleats keep the liner from shifting under foot. **INFORMATION:** Husky Liners, 800.344.8759, huskyliners.com.

#### 9 TONKA RIPSAW

Looking for something for the little off-roaders in your life? Children ages 3 and up will experience the excitement of driving a Jeep Wrangler on an abandoned mine in the rocky hills of Ripsaw Summit. Completely new for 2015. Be the first to hit this rugged terrain. Along with the Jeep Wrangler, the package comes with three 90-degree trail pieces and seven straight tracks. Available at Toys-R-Us this holiday season. **INFORMATION:** Tonka, 800.882.3808, tonka.com.

#### 10 LMC LED HEADLIGHT

These 7-inch, sealed-beam, LED headlights deliver a DOT-approved bright white light that offers superior performance for off-road and nighttime driving. Improve visibility with a whiter light output (5,000 degrees K) that is closer to the color temperature of daylight than conventional lights. The bulb-free design has a longer life and uses less energy than standard and halogen headlights. **INFORMATION:** LMC Truck, 800.562.8782, lmctruck.com.





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## 11 SUMMIT JUMP START PACK

Summit Racing Equipment's Professional Jump Start & Power Supply Pack has 300 cranking amps—powerful enough to jump-start gasoline and diesel engines up to 4.8L. You can also use it to charge cellphones, tablets, speakers, and other portable USB devices. The 12-volt lithium-ion battery offers up to 1,000 full charging cycles. The pack also has an LED flashlight, a strobe light, and a three-in-one USB adapter, plus Apple 30-pin and Lightning charging ends. A wall charger, a 12-volt DC charger, jumper cables, and a storage case are also included. **INFORMATION:** Summit Racing Equipment, 800.230.3030, summitracing.com.

## 12 RUST-OLEUM TRUCK BED LINER

The Rust-Oleum Truck Bed Liner Kit is a two-component, epoxy- and rubber-based product designed for maximum protection and easy do-it-yourself application. This easy-to-apply coating can be used to recoat and restore worn, unfinished, or previously finished metal truck beds. The extremely durable coating prevents truck bed damage caused by scratches, rust, and weather while



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enhancing the appearance of the vehicle. **INFORMATION:** Rust-Oleum, 877.385.8155, rustoleum.com.

## 13 QUADRATEC ULTIMATE FLOOR LINERS

Quadrtec Ultimate Floor Liners were engineered for the most precise fit in your Jeep. Ultimate Floor Liners feature a rugged off-road tread design and a sturdy carpet attachment system and are constructed of the finest TPE material for extreme durability. A deep tread depth and the sidewall design allow these to hold all the muck. These floor liners are engineered and made in the USA for the best fit possible. **INFORMATION:** Quadrtec, 800.745.2348, quadrtec.com.

## 14 SUPERCHIPS JEEP FLASHPAQ F5

Superchips Flashpaq F5 features a new, full-color, high-definition, 2.8-inch screen; a redesigned graphic interface; increased memory with a faster processor for improved tuning and updating speed; a slim, sleek case that fits in the palm of your hand; and more. The device also features performance levels designed for



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your Jeep whether you are off-road crawling, towing down the highway, or anything in between. **INFORMATION:** Superchips, 888.227.2447, superchips.com.

## 15 SYNERGY MANUFACTURING GRAB HANDLES

Synergy Manufacturing Grab Handles are the perfect addition to any Jeep. Made from high-quality 1-inch-diameter tubing, they provide a convenient and solid grab point for getting in or out of the vehicle. They also keep your hands safe and free from the rollover or door openings in the event of a rollover. **INFORMATION:** Synergy Mfg., 805.242.0397, synergymfg.com.

## 16 PAINLESS PERFORMANCE TRAIL ROCKER

Your only weatherproof option for controlling up to eight accessories on your JK Wrangler! This kit mounts five switches in the dash for a factory-installed look. The power center includes a bolt-on bracket to mount under the hood with 200 amps of fused protection. Easily installed with Painless' detailed instructions and plug-n-play design. **INFORMATION:** Painless Performance, 800.423.9696, painlessperformance.com.





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## 17 M.O.R.E. HIDE-A-STEP

M.O.R.E.'s innovative and unique Hide-A-Step has made it easier than ever to get into 4x4s that have large tires. Affordable and easy to install, the retractable step lowers your step-up by a full 11 inches. It is available in both silver and black, features a convenient quick-disconnect feature, and is zinc plated to protect against harsh winter conditions and road hazards. **INFORMATION:** Mountain Off Road Enterprises, 877.533.7229, mountainoffroad.com.

## 18 LEATHERMAN CRUNCH

Locking pliers that fold away make the Leatherman Crunch unlike any multitool available today. The Crunch clamps up to a 1-inch-diameter tube, and if you remove the adjusting screw you will find a hex-bit adapter built right in. With 15 tools, including locking blades that release with the push of a button, the Crunch will take a bite out of any job. **INFORMATION:** Leatherman, 800.847.8665, leatherman.com.

## 19 JKS J-CAL PROGRAMMER

JKS has the perfect addition for JK owners looking to dial in the electronics on their Jeeps. The J-Cal programmer corrects

speedo for different tires size and gear ratios; gives additional locker options on Rubicons; gives you engine idle, ESP, TPMS, radio, DRL, headlight, turn signal, and horn chirp customization; and lets you read and clear diagnostic codes. **INFORMATION:** JKS Mfg., 517.278.1226, jksmfg.com.

## 20 RUBICON EXPRESS STEERING STABILIZER

Make sure your steering system can handle those big tires. Rubicon Express' steering stabilizer features a 1 $\frac{5}{8}$ -inch piston for maximum control and an  $\frac{11}{16}$ -inch chrome shaft for maximum strength. The oversized shock body allows more fluid capacity, and double-welded rings add durability for a great-performing stabilizer both on- and off-road. **INFORMATION:** Rubicon Express, 877.367.7824, rubiconexpress.com.

## 22 OFFROAD DESIGN HEAVY-DUTY SHACKLES

The front shackles on any leaf-sprung straight axle truck will be a weak point at some time. If you're lucky, they wear and just handle terrible. If you're not lucky, they break. Offroad Design upgrades every piece of the shackle system to keep this

from happening. ORD has versions for any stock or lifted GM straight axle truck from 1969 to 1991. **INFORMATION:** Offroad Design, 970.945.7777, offroadaddesign.com.

## 23 TRAIL SPORT WHEEL SPACERS

Increase overall axle width and increase tire clearance with Trail Sport's billet aluminum wheel spacer kits. These premium-quality wheel spacers are made from forged 6061 billet aluminum and are available in a wide variety of bolt patterns to fit most common applications. The included Grade 8 hardware ensures years of strength and durability. Installation is quick and easy. **INFORMATION:** Trail Sport, 909.370.0144, trailsport4x4.com.

## 23 PREMIER POWER WELDER'S LEARN TO WELD DVD

Knowledge is a gift that lasts forever. If you want to know how to be prepared to weld on the trail, pick up Premier Power Welder's *Learn to Weld* DVD. Experienced welding instructor Michael Vanvakaris explains to Rick Russell exactly how to weld on the trail, beginning with the basics on the safety equipment needed. Then it's on to preparation, electrode types (rods),



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striking an ARC, and welding patterns. **INFORMATION:** Premier Power Welder, 800.541.1817, premierpowerwelder.com.

## 24 WARN EPIC TREE TRUNK PROTECTOR

The Warn Epic Tree Trunk Protector is designed to protect a live tree from damage during winching and self-recovery. The strap is constructed of premium-quality nylon with an encased red warning marker to indicate damaged webbing. Plus, end loops are reinforced with durable forged steel ring connectors and E-coated for premium protection against wear and abrasion. **INFORMATION:** Warn, 800.543.9276, warn.com.

## 25 LOKAR ANCHOR-TIGHT FLEXIBLE DIPSTICK

Lokar's patented Anchor-Tight Locking Flexible Dipsticks have many advantages over conventional dipsticks, such as no leaking even with the transmission upside-down. Additional features include a locking mechanism that eliminates expulsion of the dipstick handle under trans pressure, a bolted-in sealed pan fitting, large filler tube that accepts stan-

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dard transmission funnels, a Teflon-lined stainless braided outer housing, and a flexible inner dipstick-measuring cable for accurate fluid measuring. **INFORMATION:** Lokar, 877.469-.440, lokar.com.

## 26 ARB E-Z DEFLATOR

Airing down at the trailhead is a time-honored tradition. The unique, patented design of ARB's E-Z deflator allows for removal of the valve core for rapid tire deflation, while also providing an accurate pressure reading via the simple movement of a sliding valve. Includes a protective canvas pouch and instruction sheet. **INFORMATION:** ARB USA, 866.293.9078, arbusa.com.

## 27 OPTIMA DIGITAL 400 BATTERY CHARGER

The Optima Digital 400 automatically maximizes battery life and performance with Optima's built-in battery health mode, which can recover discharged batteries that others cannot. LED indicators prompt the user for quick and easy selection of charge and maintain profiles by battery type, including AGM and standard flooded batteries. **INFORMATION:** Optima Battery, 888.867.8462, optimabatteries.com.



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## 28 EASTWOOD UNDERHOOD LED LIGHT

Eastwood's Underhood Professional Folding LED Light boasts a 1,400-lumen output and can be operated on the high setting for about 1½ hours or the low setting for about 3 hours on a full charge. This light extends from 48 to 68 inches so it can span most vehicle hoods without a problem. The center sections of this light rotate independently a full 180 degrees so you have the ability to aim the light where ever you need it. **INFORMATION:** Eastwood, 800.343.9353, eastwood.com.

## 29 PRO COMP ACCUPRO

Are you installing larger tires and wheels on your vehicle? If so, ProComp has the solution to your speedometer calibration issues with the Accupro. This plug-n-play device can recalibrate your speedometer and odometer, adjust transmission shifts, and clear DTCs. The Accupro is easy to use and plugs right into your rig's OBD-II port. **INFORMATION:** Pro Comp, 800.776.0767, procompusa.com.

## 30 AEV BIGBOY SAW

The AEV BigBoy is a folding saw that would be right at home under the seat of





your Jeep, but it's also small enough to be packed on a motorcycle or snowmobile. With the low-angle curve and hard chrome-plated blade, this is the ideal multipurpose folding saw for cutting big jobs down to size. **INFORMATION:** American Expedition Vehicles, 248.926.0256, aev-conversions.com.

### 31 LIFETIME LED MAGNETIC UTILITY LIGHT

This 15-watt magnetic LED work light is corded and fits into your cigarette lighter. Now when you really need to see on those dark roads or unlit locations you can just plug the Lifetime LED Utility Light right into your car and get your job done. This light is small enough to stay out of your way when not in use but powerful enough to give you the LED lights you need. **INFORMATION:** Lifetime LED Lights, lifetimeledlights.com.

### 32 IDIDIT STEERING WHEEL ADAPTORS

These adapters from ididit allow you to use just about any aftermarket steering wheel out there on your Jeep or whatever 4x4 you drive. They are offered in a three-bolt pattern as well as five-, six-, and nine-bolt patterns. These billet aluminum

adaptors are available in a brushed or polished finish, semigloss black powder-coat, and chrome. **INFORMATION:** ididit, 517.424.0577, ididit.com.

### 33 TREAD LIGHTLY MEMBERSHIP

The biggest tires and strongest axles won't do you any good if you have no place to use them. That is why a membership to a land advocacy organization such as Tread Lightly is a good idea. For \$25 you get a one-year membership that includes a subscription to the *Trails* newsletter and discounts from Falken, Discount Tire, and Goal Zero that far exceed the membership price. **INFORMATION:** Tread Lightly, 800.966.9900, treadlightly.org.

### 34 ZONE COLORADO LIFT KITS

Zone Offroad has several kits for the new GM Colorado/Canyon to fit under your tree this year, including 1¼-inch leveling kits, 1½-inch body lifts, 2¾-inch combo kits, and 5½-inch IFS lift kits. The 2¾-inch combo kits combines the 1¼-inch leveling kit with the 1½-inch body lift, allowing you to fit up to 33-inch tires with a smooth factory lift ride. **INFORMATION:** Zone Offroad, 888.998.9663, zoneoffroad.com.

### 35 POWERTANK TIRE INFLATOR

Powertank's TIG-8500 is the newest addition to the company's tire inflator lineup. The pressure range is zero to 60 psi so it covers low off-road tire pressures up to most truck tire pressures. The digital display makes night viewing easy and offers accuracy that can't be beat by any analog gauge. **INFORMATION:** Powertank, 209.366.2163, powertank.com.

### 36 BROWNELLS ESSENTIALS STRANDED KIT

Brownells ESG Essentials Stranded Kit will help sustain you if you're stranded in your car or otherwise cut off from normal supplies due to bad weather or another emergency. It can also help you self-rescue. The kit includes a 24-pack of AA batteries, a Fire Lite Kit, a pocket stove with fuel, a Stansport saw, a multitool shovel, a Stansport compass, a mess kit, water filtration, a first aid kit, insect repellent wipes, and a weather alert radio. It's all packed into a handy organizer bag with a hook-and-loop ESG patch for instant identification. **INFORMATION:** Brownells, 800.741.0015, brownells.com.





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## ABS WOES

**Q** I have a 2006 Chevy Silverado 4x4 with a 6-inch lift and 35-inch tires. It has been lifted for several years and has been a great all-around truck. However, the other day I was driving on the highway when all of a sudden the ABS light and parking brake light came on, and the message "Service Brake System" showed up on the instrument cluster. The brakes seem to work just fine, but every time I have started the truck since that day, the message appears. I've checked the fluid level and the ABS fuse, and even disconnected the battery to see if I can reset the system, but this same warning still appears. I don't know what to do next. Help!

KYLE S.

*Via nuts@4wheeloffroad.com*

**A** You mentioned that the brakes seem to work fine, but more than likely the ABS system on your truck is no longer working, so it's important that you address the situation right away. Don't wait for a panic stop to discover that your truck's brake system isn't up to snuff.

The best thing to do is start with a good scanner and see what codes the system is throwing. Unfortunately most of the inexpensive parts store code scanners won't pull ABS system codes, so you may need to take the truck to a shop with a good scanner in order to read the codes. Without those codes, it's anybody's guess as to what the problem could be.

You've already checked the fuses, which is a good first step. The next would be to inspect the wiring going to the sensors and the control module. Your truck has three wheel speed sensors: one mounted to the hub on each front wheel and one on the tailshaft of the transfer case. There's also a control module attached to the ABS valve assembly. Any one of these four components could be the source of the problem along with the wiring that connects the various components. The front wheel

speed sensors are known to be problematic and can get fouled with corrosion, especially if you live in a rainy climate. They can also be damaged when the wheel hubs go bad (another common issue, especially with larger tires).

The ABS control module on your truck was used for several years on many different truck models and is also known to be a little troublesome. As mentioned, the module is attached to the ABS valve assembly, which may be located under the hood or mounted to the frame just under the floor of the driver seat. There are videos out there showing how to open up, inspect, and repair some commonly broken solder joints on the circuit board inside of the module, but unless you're really familiar with soldering electronic components, I wouldn't recommend trying it. Plus, there have been some revisions to that module that address these failures, and your truck should have a module with those revisions. The wheel sensors can run over \$100 each, and the module is well over \$200, so it's worth paying a shop if necessary to pull the codes and see exactly where the issue lies rather than just throwing expensive parts at the truck and hoping that one of them solves the problem.



## C-CLIP WOES

**Q** I have a 2008 Chevy Tahoe 4x4 10-bolt rearend. I'm having trouble removing the C-clip so I can pull out the axle to replace a wheel seal. I've removed the carrier pin and retaining screw and don't have enough spacing to get the C-clip out. I've also removed the ABS sensor to gain some clearance, but it's still not enough. I feel like I'm missing something because everyone I know has never had this problem. Any advice would be greatly appreciated.

JOE

*Via nuts@4wheeloffroad.com*

**A** Axles retained by C-clips are the enemy of all 4-wheelers, not just because axle

failure means the tire parting ways with the vehicle, but also because they can be a real pain to get out for other axle maintenance.

You could be fighting a combination of things. First and foremost, make sure the axle is shoved in far enough to remove the C-clip from its groove in the side gear. This usually means removing the drum or the rotor depending on how the axle is equipped. If the drum or rotor is stuck on the axle flange, it can prevent the axle from sliding in far enough to remove the clip.

If you've already tackled that, then you may be fighting the C-clip itself. Depending on the differential in your truck's axle, the window in the carrier may be very small. The window in the GM Gov-Lok carrier is especially small, and it can be difficult to get the C-clip positioned just right so that it will come out. Try using a strong magnet on a stick (those designed to retrieve loose bolts in hard-to-reach places work well) to grab the C-clip, and be aware that the open end of the C-clip must be exactly opposite of your view when you are looking at the window in the carrier horizontal to the ground. This can be difficult to gauge, so sometimes gravity can help if you rotate the window in the carrier downward and wiggle the axle to let the C-clip fall out.

Hose the C-clip down with brake cleaner to reduce the stick that gear oil might have. Other than these tips, there is no magic solution, just patience and finesse.

## BRITISH GONE BAD

**Q** Against all common sense I picked up a 1989 Range Rover. I guess I always wanted one, and the \$300 price tag was right. The floorboards are bad, it's dented and abused, and someone stole the headlight washers, but it's mine now. Besides, three of the tires were good and I needed them for my truck. It even kinda runs! It won't rev over 1,800 rpm if I put a brick on the pedal, and it sounds like a pan full of marbles. But there isn't any oil in the water, or vice versa. I'm not having much luck finding another 3.8 (or is it 3.9?) V-8 in the junkyards or online. I'm not really willing to do a rebuild either. What I really want to do is swap in a junkyard 4.3 from a Chevy truck or S-10. I'd even run a carb and ditch the electronics altogether. It's a beater toy that will never see the highways again, so emissions aren't an issue. Does anyone make an adapter for the auto trans? If not, what are my trans swap options? The transfer case has an offset rear output like a Dana 18, so that is going to limit my options for a com-



## NUTS & BOLTS

plete engine-trans-transfer case swap. I'm open to just about anything. Think cheap, simple, and easy to find. I'm an amateur fabricator with a decent shop, so I can build mounts and such, but machining isn't part of my skillset yet.

**PAUL G.**

*Via nuts@4wheeloffroad.com*

**A** British car project. What could possibly go wrong? While the British are awesome and have great accents, I must confess that I have a general aversion to the British and their ability to make vehicles in general and 4x4s specifically (ever heard the punchline to the joke about why the British don't make refrigerators?). But I also appreciate people who dare to be different. While many people (myself included) would question your sanity putting time and effort into such a rough vehicle, it is also widely acknowledged that neither logic nor sanity are common traits among those of us here on the left side of the pond.

All kidding aside, Range Rovers are kind of cool because they *are* different. I wouldn't bother finding a stock donor engine unless one fell into your lap for free because the electronics of late-1980s British technology must be a nightmare (much as it was



on contemporary domestic vehicles of the time). Your best bet is to start with the shell and work from there, and by that I mean a complete drivetrain swap. Advance Adapters ([advceadapters.com](http://advceadapters.com)) does offer a few adapters that may mate whatever transfer case might be in your Land Rover to some of the more common domestic transmissions. However, these are pricey.

Considering this is a project and an off-road toy, you're better off swapping everything, including the rear axle, for components that are more widely supported by the aftermarket. A 4.3L Chevy with a TH700-

R4 transmission and NP231 transfer case is a great option due to all of the aftermarket support for this swap, but this gets you a transfer case with a centered rear output and a front output on the wrong (driver) side. This means swapping the rear axle and the transfer case as well. Should you not be able to adapt the Rover transfer case, you will be able to adapt whatever transfer case you choose with a passenger-side drop. Your only non-exotic offset T-case option is a Dana 18, but there are some others from Toyota. Should you choose to go with a centered rear output case, measure the width of the stock axle and start researching what might work that's cheap. I would venture to guess that a Ford 8.8 out of an Explorer, van, or F-150 would be close enough to the right width, and these are cheap, well supported, and available everywhere.

Cut, hack, and modify as necessary to make the above modifications fit. You can probably salvage the front axle and avoid doing a lot of suspension and steering work by upgrading the axleshafts and regearing to match the rear, but then again, the wheel bolt patterns will be different. Regardless, you might consider keeping the stock suspension design, as it is actually really well thought out and performs great. Beyond these basic parameters, go with whatever you can scavenge cheap, and let us know how it turns out. 🚗



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